











Department of Marine and Fisheries, Canada  
METEOROLOGICAL SERVICE

# MONTHLY WEATHER REVIEW

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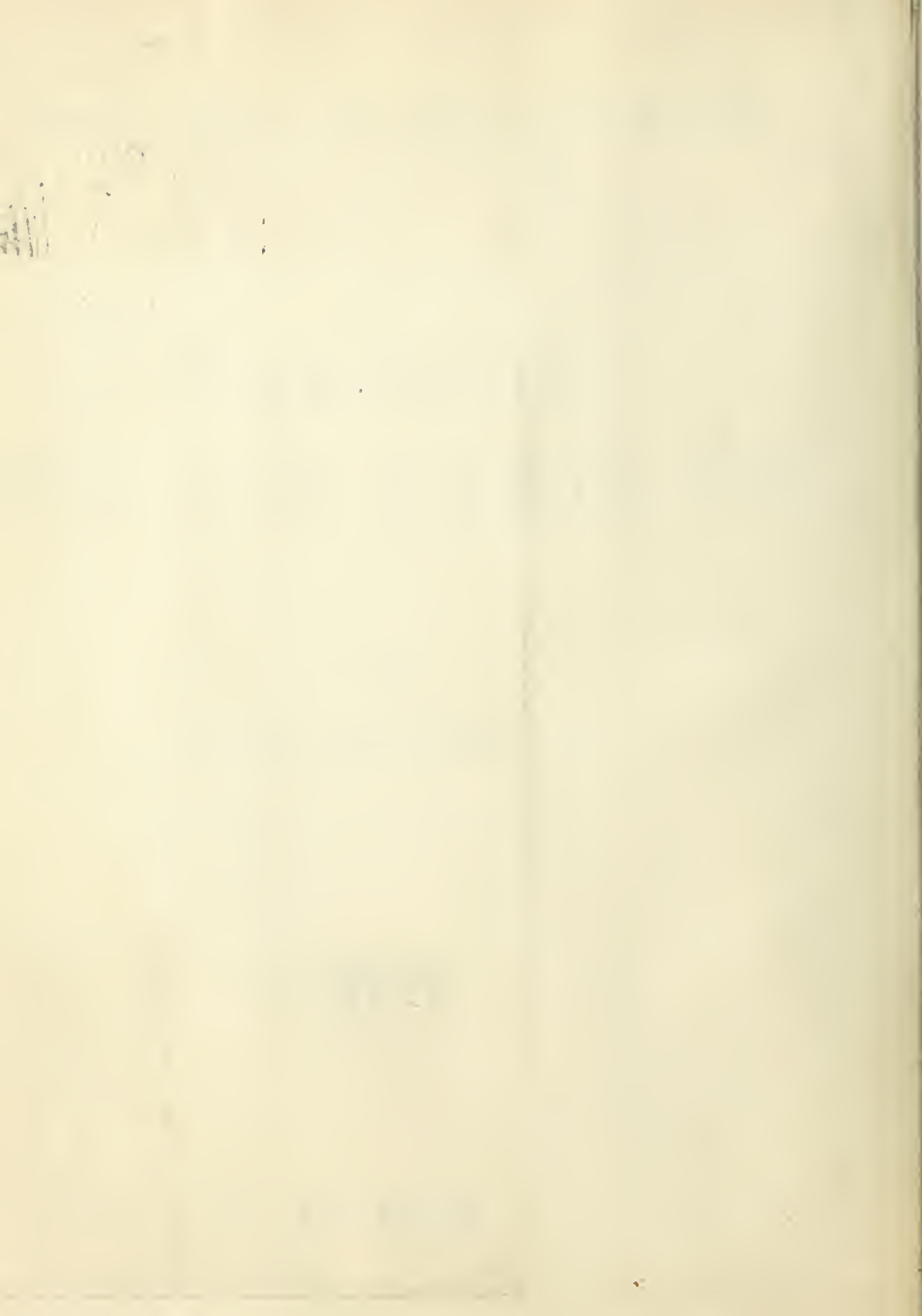
R. F. STUPART, Director

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DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

# Monthly Weather Review.

VOL. XXXVI.

JANUARY, 1911.

No. 1.

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## GENERAL SYNOPSIS.

From the Pacific Coast to the Lake Superior districts of Ontario the month was one of extreme cold. The mean temperature of the western half of the Dominion ranged from  $2^{\circ}$  to  $16^{\circ}$  below the average temperature of January for some twenty years previous. In the Ottawa Valley and along the Lower St. Lawrence and Gulf, the mean temperature was also subnormal but not to such a marked extent. In southern Ontario, western Quebec and the Maritime Provinces, however, the month was warmer than usual.

With the exception of a very few days the western portion of Canada was under the influence of areas of pronouncedly high pressure and their accompanying cold waves throughout the month. The path of these areas lay across northern British Columbia and the Prairie Provinces, but their influence was sufficiently extensive to depress the temperature of Vancouver Island and the southern mainland of British Columbia much below the seasonal average. On the Island  $2^{\circ}$  to  $4^{\circ}$  below the normal were recorded, and on the lower mainland from  $6^{\circ}$  to  $10^{\circ}$ . In the Cariboo district the most severe cold was experienced and here the greatest departures from normal,  $11^{\circ}$  to  $14^{\circ}$ , occurred.

Very low mean temperatures were recorded in the Prairie Provinces, across which lay the path of the cold waves. In the district lying immediately north and east of Edmonton,  $60^{\circ}$ , and more, below zero were recorded between the 11th and 13th, while  $40^{\circ}$  below occurred nearly everywhere in these provinces on the 1st, 2nd, 3rd, 11th, 12th, 13th and 14th. The average temperature of the month at all stations was between  $5^{\circ}$  and  $15^{\circ}$  below zero. On the 4th, 5th, 6th, 24th, 25th, 28th and 29th, the temperature rose to the freezing point or nearly so, and these were the warmest days of the month.

There were many stormy days during January throughout the west, with high winds and heavy snowfalls. The total snowfall varied between 5 and 20 inches in the Prairie Provinces, but an average would appear to have been 10 inches. In British Columbia, west of the Rockies, where during the winter months a very different climate prevails, there was much rain, and thunderstorms were reported from some localities. On the lower mainland snow and rain alternated during the greater part of the month, while on the higher levels the precipitation was mainly snow.

The district of Ontario lying to the west of Lake Superior experienced much the same weather during the month as the western provinces, except that the snowfall was not heavy. In the remainder of Ontario, with the exception of the Ottawa Valley, the mean temperature was higher than the January normal. The 3rd, 4th, 5th, 16th to 19th, were very cold days with temperatures considerably below zero. Several days, however, were very mild, with temperatures exceeding  $40^{\circ}$  throughout the greater part of the province.  $57^{\circ}$  was reported from Woodstock, and  $63^{\circ}$  from Pelee Island, on the 25th. Precipitation was in defect of the usual quantity.

In western Quebec the mean temperature of January was about  $1^{\circ}$  warmer than the normal, but along the Middle and Lower St. Lawrence and Gulf, the month was colder than usual by about  $1^{\circ}$ . Except at Quebec City and its immediate vicinity alone, the precipitation appeared to be less than the normal.

In New Brunswick and Prince Edward Island, the month was warmer than usual, with several mild days. Temperatures well below zero were recorded, however, from the 16th to the 18th, on the 20th, and at some places on the 30th and 31st.

In Nova Scotia, although mean temperatures were higher than normal over the greater part of the province, yet there were local exceptions.

An excess of precipitation was reported from northern New Brunswick and Cape Breton, but elsewhere in the Maritime Provinces less than the usual amount was recorded.

### ATMOSPHERIC PRESSURE.

The mean value of the atmospheric pressure for January was above the average from Saskatchewan to the Maritime Provinces, while in Alberta and British Columbia it was below.

The positive departures from normal were generally about 0.05 of an inch, and the extreme was 0.09 of an inch at Kingston, Ont. Negative differences were at most places about 0.10 of an inch, and the extreme was 0.11 of an inch at Barkerville, B. C., and Banff, Alta.

### HIGH AREAS.

Twelve areas of high pressure were charted, more than are generally recorded for January. Nine first appeared in the Yukon Territory, one in northern British Columbia and two on the United States Pacific Coast. During nearly the whole month a great anticyclonic system covered the Yukon Territory and the far North, and many of the nine areas which travelled from these regions were more strictly dislodgements or secessions from the great parent system. The areas either passed well to the northward of the Great Lakes into the St. Lawrence Valley and the Maritime Provinces or else well to the southward of the Great Lakes. The excessive cold by which they were usually accompanied caused a month of decidedly cold weather almost throughout the Dominion.

### LOW AREAS.

Thirteen areas of low pressure were charted for the month; seven first appeared either on the northern British Columbian or the Alaskan Coast, two on the southern coasts of British Columbia, one in the South Pacific States, one in the Middle Mississippi Valley, one in the Gulf of Mexico and one to the southward of Nova Scotia. The general course of the areas was over or to the northward of the Great Lakes and ultimately across Eastern Canada and Newfoundland. Many of the systems were of pronounced energy, and strong winds and gales were of frequent occurrence, particularly in the Maritime Provinces and Newfoundland. Some very heavy gales were also experienced on the British Columbian coast.

### WINDS.

The following table gives the general direction and force of the wind during the month over the Dominion. Owing to the topography of the interior of British Columbia, wind records cannot be accurately obtained there, but the mileage given for Banff, which is obtained on the top of Sulphur Mountain, 7,484 feet above sea level, is instructive.

In Alberta no records have been so far taken in the southern portion, and Calgary at present is not reliable. A lengthy series of records from Edmonton go to prove that the wind mileage is quite moderate in northern Alberta. The Toronto record is registered at Toronto Island, giving the full force of the winds which blow on Lake Ontario. In Quebec and the Maritime Provinces the gauges are well exposed.

PROVINCE.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of Gales.	Number of Strong Winds.	Number of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Victoria	7349	498	40	3	6	8	Variable.
Triangle Island	(19 days) 10518	1183	87	5	8	3	
ALBERTA.							
Edmonton	3515	423	36	2	0	3	Variable.
Calgary	2330	162	16	0	1	5	
Sulphur Mt., Banff	(27 days) 15290	1025	56	10	6	4	
SASKATCHEWAN.							
Qu'Appelle	5407	394	28	0	3	10	North and West.
Battleford	5690	413	60	1	8	8	
MANITOBA.							
Winnipeg	8430	302	36	2	11	10	North and West.
ONTARIO.							
Port Arthur	6931	453	35	5	7	10	Variable.
Perry Sound	7698	412	31	6	8	6	
Woodstock	8014	537	34	6	8	6	
Toronto	10641	506	52	6	8	6	
QUEBEC.							
Montreal	4518	652	39	2	12	11	North and West.
Quebec	11062	616	45	5	15	4	
MARITIME PROVINCES.							
Pt. Le Preaux	15442	927	48	6	9	8	Northwest, West and Southwest.
Halifax	10526	725	46	6	9	8	
St. John	10852	817	44	6	9	8	
Flat Pt.	11829		65	6	9	8	



In the Maritime Provinces, where in most localities navigation remains open the year round, the gales were experienced on the 4th, between the 9th and 10th, between the 19th and 20th, on the 21st, between the 28th and 29th, and between the 30th and 31st. These storms were all successfully warned except the one which occurred between the 19th and 21st, and which was generally moderate.

#### TEMPERATURE.

Extreme cold prevailed over the Western Provinces of Canada during the month of January. In the greater portion of Southern Ontario, however, the month was warmer than average, and this was also the case in the Maritime Provinces and Western Quebec.

*The highest and lowest temperatures recorded in each Province during the month of January, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia,	50° at Sooke on the 1st, and Victoria on the 5th	—50° at Chilcotin on the 13th.
Alberta,	49° at Macleod on the 4th.	—76° at Fort Vermilion on the 11th.
Saskatchewan,	36° at Stanley Mission on the 22nd	—60° at Onion Lake on the 13th.
Manitoba,	32° at Ninga on the 28th.	—45° at Oakbank on the 3rd, and Dauphin on the 11th.
Ontario,	63° at Pelee Island on the 25th.	—48° at White River on the 6th.
Quebec,	45° at Ste. Anne de Bellevue on the 2nd.	—47° at Abitibi on the 6th.
New Brunswick,	52° at Grand Manan on the 4th.	—24° at Chatham on the 18th.
Nova Scotia,	60° at Wolfville on the 4th.	—20° at Antigonish on the 18th.
P. E. Island,	50° at Hamilton on the 3rd.	—15° at Charlottetown on the 18th.

#### PRECIPITATION.

From the Pacific Coast to Eastern Manitoba the precipitation was in excess of the normal amount, but elsewhere in the Dominion excess was reported from but few localities.

#### BRIGHT SUNSHINE.

In British Columbia, Alberta and Saskatchewan the duration of bright sunshine was much less than the normal. In Manitoba there were more bright days than usual, and this was the case in Eastern Ontario also. Elsewhere there was little difference from normal.

#### SNOW ON THE GROUND.

In British Columbia there was sleighing on several days. At the close of the month in the Western Provinces the depth varied from a trace in Southern Alberta to 8 inches at Edmonton, 14 at Prince Albert, and about 6 inches over most of Manitoba. In Ontario the snow on the ground ranged from about 2 inches in the south to 27 inches in the Ottawa Valley, and 21 inches in New Ontario. Quebec and Northern New Brunswick reported a depth of from 20 to 48 inches of snow, and the Maritime Provinces 5 to 28 inches.

#### THICKNESS OF ICE.

Thickness of ice as reported from various stations was as follows:—

WESTERN PROVINCES.—Edmonton, 22 inches; Medicine Hat, 24 inches; Swift Current, 30 inches; Qu'Appelle, 24 inches; Minnedosa, 27.5 inches.

ONTARIO.—Port Arthur, 14 inches; White River, 14 inches; Bruce Mines, 16 inches; Gravenhurst, 18 inches; Clinton, 4 inches; Strathroy, 10 inches; Port Burwell, 9 inches; Georgetown, 14 inches; Kingston, 7.5 inches; Lansdowne, 9 inches; Renfrew, 12 inches; Ottawa, 24 inches.

MARITIME PROVINCES.—Chatham, 16 inches; Yarmouth, 8 inches; Sydney, 16 inches; Charlottetown, 12 inches.



# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JANUARY, 1911.

a Barometer not reduced to Sea Level. \* Stations not furnished with registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above sea level, in feet.			PRESSURE.			TEMPERATURE.				DIRECTION OF WIND FROM.										VELOCITY OF WIND.			PRECIPITATION.											
			Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Wentworth's.	Highest.	Lowest.	Date.	Mean daily range.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	C.	Total number of observations.	Mean miles per hour.	Highest days per hour.	Late and direct from.	Amount.	Difference from average.	Heaviest fall in month.	No. of fair days.	No. of days with 1/10 of more.	No. of aurora.	No. of fog.		
Albert (Beaver Creek).	49 15 124 49	390	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Agassiz.	49 11 124 31	32	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alton.	43 33 123 38	2240	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barkerville.	49 33 123 33	4180	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bella Coola.	52 2 121 33	1150	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bellin Lake.	52 38 126 26	300	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chabine (Big Creek).	49 30 113 30	300	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cranbrook.	49 10 125 17	10	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clayton.	49 25 123 17	170	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cowichan (Tombulm).	49 10 121 57	21	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chilliwack.	49 10 121 9	1180	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endicott.	49 32 119 7	1180	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fort St. James (Stuart's Lake).	49 11 119 36	2880	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fruitvale.	49 9 117 31	1072	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden.	51 16 117 29	2660	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Holberg.	49 33 126 10	10	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Holby (Nickel Plate).	49 23 121 25	1720	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hope.	52 17 131 7	1215	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keddy Bay.	49 41 120 29	1215	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kamloops.	49 5 123 1	90	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ladner.	49 33 123 1	30	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Massett, Q.C.T.	49 10 123 37	125	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nanaimo.	49 12 122 37	2120	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nicola Lake.	49 12 122 37	20	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Westmen.	49 13 122 34	330	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Westminster.	49 29 117 21	1720	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nelson.	49 32 119 29	1200	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Okanagan Mission (Klown).	49 29 120 29	1630	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Princeton.	49 29 119 33	1630	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pemberton Hatchery.	50 20 122 33	170	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prince Rupert.	52 30 122 30	1700	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quaselle.	51 0 115 6	1170	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Revelstoke.	49 5 117 48	300	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roseland.	49 16 122 23	125	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roslin (Stave Fall).	50 12 119 33	1132	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Salmon Arm.	50 12 119 33	1132	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swanton (Garry Point).	49 21 123 17	1000	40 18 30	40 18 30	40 18 30	0	31.1	0	13.5	43.0	3.0	13.6	0	0	0	0	0	0																			

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# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JANUARY, 1911.

a barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	PRESSURE.			TEMPERATURE.					DIRECTION OF WIND FROM					VELOCITY OF WIND.			PRECIPITATION.			No. of days.	No. of days with rain or more.	No. of days with snow or more.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
			Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Winds observed in.	Highest.	Date.	Lowest.	Date.	Mean daily.	Mean relative humidity.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.				S.	S.W.	W.	N.W.	C.	Total number of observations.	Mean miles per hour.	Highest day's velocity.	Date and direction from.	Amount.	Difference from average.	Highest fall in month.	Days with rain or more.	No. of days with snow or more.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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# PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING JANUARY, 1911.

STATIONS.	RAINFALL.					SNOW FALL.				REMARKS.
	Amount in inches	No. of Days over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA—										
Alkali.....				in.		in.	11	in.	9	Thunderstorm on 25.
Albion.....				0.13	6.7	33.0	22	4.1	15	
Annis.....	0.27	3	28	0.67	18	16.5	7	6.0	27	
Beaver Lake.....	3.90	12	19	1.48	8	99.0	19	13.8	27	
Bear Creek.....	5.13	9	23	1.55	8	12.4	8	4.8	26	
Coquitlam.....	6.21	8	22	1.21	8-16					
Denman's Island.....	5.31	9				92.5	15	12.0	18	
Ferguson.....				1.22	9	36.0	16	7.5	27	
Goldstream Lake.....	4.78	17	14			14.9	11	3.3	17	
Grand Forks.....										
Hornby Island.....				1.14	9	3.0	3	1.0	21-26	Fog on 5.
Jordan River.....	10.77	21	10	1.50	16	2.8	5	9.0	12-27	
Little Qualicum (French Creek, V.I.).....	1.58	5	26			4.3	6	1.5	9	
Monte Creek.....	4.75	3	28	2.30	1	89.0	11	19.0	28	
Naas Harbour.....	2.82	7	24	1.61	4	43.6	18	10.4	14	
Skidegate.....						37.5	12	8.5	6	
Swift River Dam.....										
ALBERTA—										
Bardo.....						3.3	6	1.0	9-18	
Bismark.....						3.9	3	2.7	9	
Bruderheim.....						6.6	3	3.0	19	
Bittern Lake.....						7.5	6	2.0	10-26	
Bantry.....										
Brooks.....						3.5	7	1.5	8	
Conjuring Creek.....										Aurora on 1, 2; fog on 13.
Coutts.....						10.7	9	4.5	5	
Campsie.....						35.7	11	16.0	9	
Caldwell.....						20.0	8	4.0	5-23	
Dorelee.....						2.0	1	2.0	9	
Elkwater.....						7.5	1	5.5	10	
Grassy Lake.....										
Jumping Pound.....						T	1	T	2	
Kimball.....										Aurora on 4, 29.
Lacombe.....						5.8	6	2.5	9	
Langdon.....						1.2	2	1.0	11	
Lech Sloy.....						10.7	1	5.1	10	
Linham.....						1.8	3	1.0	9	
Lyndon.....						16.0	8	6.0	9	
Many Berries Ranch.....						25.5	8	12.3	9	
Macleod.....						1.8	1	1.8	9	
Mayercroft.....						8.5	4	3.0	5-26	
Okotoks.....						8.5	5	2.8	20	Aurora on 6, 17, 23, 24, 25, 26, 27, 28, 29.
Ponoka.....						20.0	18	4.0	19	
Seven Persons.....						30.4	1	15.0	18	
Sion.....										
Tilley.....										
Wabamun.....										
SASKATCHEWAN—										
Carmichael.....						16.7	6	4.5	11	
Coule.....						9.5	7	3.3	10-31	
Elm How.....						13.0	7	4.0	9	
Gull Lake.....										
Hanley.....						8.3	7	3.0	9	
Last Mountain.....						15.4	15	3.0	25	
Maple Creek.....						5.0	3	2.0	19-31	
Kindersley.....						6.0	3	3.0	31	
Kelvinhurst.....										
Willow Creek.....										
MANITOBA—										
Cartwright.....						16.5	9	6.0	31	Aurora on 24, 27. Aurora on 21.
Deloraine.....						12.5	9	2.5	7-9	
Gretna.....						10.4	5	4.0	4	
Norquay.....						4.5	4	2.5	8	
Rapid City.....						13.7	9	8.3	10	
ONTARIO—										
Arden.....	2.15	4	27	0.85	11	1.0	1	1.0	25	Fog on 11, 12, 13, 11.
Deer Park.....	1.01	5	26	0.41	27	1.3	3	3.5	6	
Dutton.....	0.50	2	24	0.40	11	4.0	1	4.0	5	
Ensdale.....	0.38	3	27	0.15	2	7.5	6	2.5	9	
Georgetown.....	0.86	8	23	0.28	11	6.0	7	2.5	6	Fog on 1, 11, 25, 26, 27; aurora on 24.
Grantham.....	0.39	6	25	0.28	27	5.6	4	3.5	4	
Grand Valley.....										
Goderich.....	0.50	2	21	0.30	27	22.0	8	12.0	16	
MacCue.....	0.15	1	20	0.15	21	12.0	6	3.0	10	
Orangeville.....	0.71	3	28	0.30	2	11.9	10	2.1	9	
Princeton.....	2.71	4	27	1.35	2	8.0	2	6.0	7	
Sydenham.....	2.95	4	27	2.00	1	11.0	4	4.0	2	
Strathroy.....	1.62	2	27	0.50	28	9.5	4	5.0	6	
Watford.....	1.11	2	29	0.50	11			1.0	3	Fog on 2. Fog on 2, 13. Fog on 27. Fog on 26, 27.
Westport.....	0.58	5	26	0.51	27	6.9	6	3.0	3-7	
Wooler.....	1.51	5	26	0.55	11	6.0	2	3.0	17	
Westminster.....	1.95	6	25	0.31	8	13.0	4	3.0	16	
Warton.....	1.16	9	22	0.15	27	11.0	13	2.0	9-30	Fog on 1, 2, 13, 14, 20, 26, 27, 29.
Wesley.....	0.54									
QUEBEC—										
Timiskaming.....										
Kipawa.....										
NEW BRUNSWICK—										
Point Escombec.....	0.24	2	29	0.13	3	20.6	6	4.8	28	Fog on 3.

MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
JANUARY, 1911.

STATIONS.	HOURS ENDING															
	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.
Victoria .....				.09	.19	.19	.15	.19	.12	.09	.06					
Nanaimo .....			T		.08	.15	.15	.13	.06	.06	.05					
Vancouver .....				.03	.05	.10	.11	.05	.07	.03	.03					
Agassiz .....					.04	.10	.09	.08	.05	.02						
Dunvegan .....				.02	.08	.18	.39	.39	.35	.20	.02					
Summerland .....			.01	.16	.22	.27	.31	.30	.31	.17						
Kamloops .....				.02	.08	.20	.34	.37	.37	.24						
Edmonton .....				.02	.24	.38	.42	.37	.32	.37	.10					
Lethbridge .....			.03	.28	.43	.47	.32	.48	.54	.55	.39	.01				
Lacombe .....				.06	.22	.24	.31	.34	.40	.31	.20	.02				
Medicine Hat .....																
Fort Vermilion .....				.01	.30	.12	.52	.52	.42	.13						
Battleford .....				.05	.30	.38	.37	.39	.29	.14						
Indian Head .....				.08	.32	.34	.39	.35	.39	.41	.09					
Moosejaw .....			.03	.14	.31	.35	.50	.52	.51	.48	.35	.01				
Rosthern .....				.20	.17	.16	.46	.44	.48	.46	.25	T				
Brandon .....			.11	.34	.34	.38	.42	.47	.48	.27	.08					
Winnipeg .....				.08	.24	.41	.44	.38	.39	.39	.28	.03				
Halleybury .....			.01	.16	.37	.46	.45	.50	.47	.46	.41	.05				
Woodstock .....			.01	.08	.22	.27	.29	.31	.35	.25	.21	.04				
Lindsay .....				.08	.26	.31	.34	.34	.38	.33	.15	.01				
Barrie .....			.01	.15	.19	.26	.30	.28	.28	.26	.09					
Toronto .....				.12	.22	.32	.31	.37	.31	.30	.32	.04				
Kingston .....		.04	.14	.30	.37	.37	.37	.41	.41	.10	.23	.08				
Ottawa .....			.05	.27	.33	.41	.45	.37	.43	.43	.37	.07				
Montreal .....				.01	.17	.30	.31	.36	.35	.29	.09					
Quebec .....			.04	.23	.31	.34	.38	.38	.40	.43	.33	.03				
Sherbrooke .....			.04	.18	.30	.40	.42	.42	.37	.42	.25	.03				
Fredericton .....			.08	.31	.40	.47	.45	.45	.44	.41	.38	.09				
Charlottetown .....			.10	.25	.33	.33	.40	.42	.45	.39	.29	.07				

	Victoria.	Nanaimo.	Vancouver.	Agassiz.	Dunvegan.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Fl. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Rosthern.	Brandon.	Winnipeg.	Halleybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.
Registered duration in hours.	33	21	14	12	18	54	50	16	102	60	72	50	73	90	100	91	82	103	63	68	76	72	46	98	58	89	88	108	95	
Percentage of possible duration %.....	12	8	5	4	22	20	19	26	38	27	33	23	28	37	39	31	31	37	22	24	26	27	34	35	24	32	31	38	34	
Difference from average %.....	-8			-11								-10	-1			+9	+5		+1	-2	+6		2	+7	+3	-10		0		
Maximum percentage in one day %.....	67	51	51	47	77	56	62	81	94	90	74	74	78	95	96	94	90	93	84	74	84	87	94	95	82	93	97	95	92	
Date of maximum .....	20	9	28	29	27	17	24	1	16	14	14	1	27	20	1	17	28	16	5	4	5	26	17	22	12	22	31	25	6	
No. of days completely clouded.....	16	21	23	25	12	14	14	15	6	5	12	5	10	4	4	12	15	9	16	19	12	16	14	9	13	13	8	9	13	

*Aurora recorded:—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Aitkensville, IV; Threehills Creek, II; Waitefield, IV; Oliver, Melfort, IV; Estevan, III; Crescent Lake, III; Campsie, IV.
2. Aweme, II; Kenora, IV; Aitkensville, III; Kakabeka Falls, IV; Waitefield, IV; Crescent Lake, IV; Grenfell, II; Campsie, IV.
3. Bruce Mines, III; Aitkensville, IV; Threehills Creek, IV; Chicoutimi, Stanley, IV.
4. Loch Sloy, Kenora, III; Aitkensville, IV; Waitefield, IV; Haileybury, III; Minnedosa, III.
5. Kenora, IV; Schreiber, IV; Haileybury, III.
6. Sion, III; Three Hills Creek, IV.
8. Glenbryan, II.
10. Aitkensville, IV; Waitefield, III; Melfort, IV.
14. Grenfell, IV.
16. Chicoutimi.
17. Sion, III.
18. Aitkensville, IV.
20. Aweme, III; Aitkensville, IV.
21. Aitkensville, IV; Oliver, Melfort, IV.
22. Aitkensville, IV; Kakabeka Falls, III; Pembina, Yarbo, III.
23. Aweme, IV; Aitkensville, IV; Sion, IV; Yarbo, IV; Glenbryan, I.
24. Cartwright, Deloraine, Georgetown, Aweme, II; Lucknow, III; Schreiber, IV; Lake Talon, IV; Montague, Sion, IV; North Bruce, III; Gravenhurst, II; Kingston, III; Montreal, III; Chaplin, IV; Brownlee, Glenbryan, II.
25. Hillsdown, IV; Sion, IV; Threehills Creek, IV; Grand Manan, IV; Oliver.
26. Pembina, Sion, II; Threehills Creek, II; Waitefield, III; Meota, IV; Crescent Lake, IV.
27. Cartwright, Aweme, IV; Kakabeka Falls, III; Pagan, Pembina, Sion, III; Threehills Creek, IV; Meota, IV; Crescent Lake, IV; Chaplin, II.
28. Lake Talon, IV; Pagan, Pembina, Sion, II; Threehills Creek, III; Waitefield, II; Yarbo, IV.
29. Loch Sloy, Aitkensville, IV; Pembina, Sion, III; Waitefield, IV; Meota, II.
30. Kenora, IV; Bruce Mines, IV; Madoc, III; Aitkensville, IV; Pembina, Abitibi, Gravenhurst, III; Haileybury, II; Crescent Lake, IV; Chaplin, IV; Brownlee.
31. Aitkensville, IV; Chicoutimi.

*Thunder recorded :*

7. Vernon, Enderby.
21. Quebec.

## FORECASTS FOR JANUARY, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1153. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta .....	77	57	17	3	85.1
Saskatchewan .....	80	69	17	3	86.3
Manitoba .....	78	58	14	6	83.3
Lake Superior .....	87	74	13	1	90.2
Lower Lake Region .....	104	84	16	4	88.5
Georgian Bay .....	104	85	19	0	90.9
Ottawa Valley .....	96	68	21	7	81.8
Upper St. Lawrence .....	90	74	19	5	84.7
Lower St. Lawrence .....	92	77	11	4	89.7
Gulf .....	99	83	15	1	91.4
Maritime Provinces West .....	121	98	13	10	86.1
Maritime Provinces East .....	120	93	18	9	85.0
Total .....	1153	966	166	23	86.9

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto,

February 28, 1911.



# Monthly Weather Review.

VOL. XXXV.

FEBRUARY, 1911.

No. 2.

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## GENERAL SYNOPSIS.

In western and southern Ontario, Manitoba, the greater part of Saskatchewan, the northern portion of Alberta, and in the Yukon, the weather of February was warmer than usual. In the Maritime Provinces and British Columbia, however, there were very few mild days, and the average of the month was between  $3^{\circ}$  and  $8^{\circ}$  below normal.

Rain fell frequently in southwestern British Columbia, and snow on many days in the north and on the higher levels, yet the total precipitation of the month was much less than is usual for February in that province. The number of hours of bright sunshine exceeded the average of the preceding 20 years. Except in the northern districts the daily range of temperature was not great, while in the south  $40^{\circ}$  was seldom reached except on Vancouver Island and the extreme southwestern mainland. The greatest difference from normal temperature occurred in the central-southern districts, where the mean of the month was  $7^{\circ}$  or  $8^{\circ}$  below the 20-year average. In the far northern portion of the province, however, conditions were reversed and the average of the month was  $4^{\circ}$  or  $5^{\circ}$  warmer than usual, and this is true of the Yukon also, the mean temperature of Dawson exceeding the normal by  $7^{\circ}$ .

The usual number of mild days did not occur during February in southwestern Alberta, while in the more northern portion of the province there were few days of bitterly cold weather, such as frequently happen in February. Consequently the southern portion reported mean temperatures below normal by from  $1^{\circ}$  to  $3^{\circ}$ , while in the north the normal was exceeded by about the same amount. In the southwestern districts the total precipitation was more than average by a small amount, while in the more northern portions there was a deficiency to about the same extent. The coldest periods were the first two days and the 26th and 27th. From the 10th to the 12th and again on the 23rd and 24th the highest temperatures, ranging between  $52^{\circ}$  and  $57^{\circ}$ , occurred at Edmonton and the stations in approximately the same latitude, or even further north, Lunnford reporting  $57^{\circ}$  and Peace River Crossing  $50^{\circ}$ . It is worthy of note that these temperatures were higher than any registered in Quebec or the greater portion of the Maritime Provinces during the month.

Colder conditions than are usual for February obtained in southwestern Saskatchewan, but the mean temperature increased to the north and east, exceeding the normal by  $1^{\circ}$  to  $4^{\circ}$  in that portion of the province. Except in the vicinity of Indian Head the snowfall of the month was less than the normal by a small amount, occurring on from two to seven days. The warmest period was that between the 23rd and 26th, but generally the temperatures were not so high as they were during the corresponding mild interval in Alberta.

Much warmer weather than generally obtains in February was experienced in Manitoba, but while the excess over normal mean temperature was scarcely  $3^{\circ}$  in western Manitoba, in the eastern portion of the province it was between  $7^{\circ}$  and  $8^{\circ}$ . The first three days of the month were very cold, temperatures not rising to zero. From the 10th to 25th, however, the day temperatures were fairly high. On the 1st, 2nd, 5th, 6th, 8th, 13th and 17th snow fell, aggregating about 8 inches in most districts. Those places where the normal precipitation was exceeded lie in the western portion of the province.



The greater part of Ontario reported mean temperatures considerably above the normal. The widest departures from normal occurred on the western shore of Lake Superior, in the Thunder Bay and Rainy River districts. In Algoma and southern Ontario, with the exception of the extreme southwestern counties of the Peninsula, this excess over average existed to a much less degree. In the eastern counties the temperature was average or a little less. Precipitation was in excess of the average amount in the Thunder Bay, Rainy River and Algoma districts, and in the Ottawa Valley, as well as locally in the central-southern counties. Temperatures of  $45^{\circ}$  to  $55^{\circ}$  were registered on the 17th and 25th.

Over Quebec and the Maritime Provinces the temperature of the month was lower than the February average, the deficiency ranging from  $2^{\circ}$  at Montreal to  $7^{\circ}$  in central Nova Scotia. It was much below zero on many days, while  $45^{\circ}$  was not exceeded except at a very few stations. At Montreal there was a small excess of precipitation, but elsewhere much less than the average quantity was reported.

#### ATMOSPHERIC PRESSURE.

Anti-cyclonic formations were of frequent occurrence in February, and the mean atmospheric pressure exceeded the average in all parts of Canada by about 0.05 of an inch. In Saskatchewan, Manitoba and from Eastern Ontario to New Brunswick, inclusive, the departures from normal were from 0.07 to 0.10 of an inch.

#### HIGH AREAS.

Eight areas of high pressure occurred during the month, six first appearing in the vicinity of the Yukon Territory and two in the Pacific States. Three of the systems carried their centres far to the northward of the Great Lakes, one passed across the Great Lakes and four passed far to the southward of the Great Lakes. The systems conformed to the usual important winter type of anticyclones, the accompanying cold waves being generally severe and widely experienced.

#### LOW AREAS.

Eleven areas of low pressure were charted; six first appeared on the far northern British Columbian or Alaskan coasts, two on the West Pacific States Coast, one in the South Pacific States, and one off the South Atlantic States coast. Eight of the areas passed over the Great Lakes and the remaining three to the southward of them, thence either over or close to the Maritime Provinces and Newfoundland. The areas were often of much energy, causing numerous high winds and gales in their transit, some of the latter being heavier on our Pacific and Atlantic coasts and over Newfoundland than elsewhere in the Dominion.

#### WINDS, FEBRUARY, 1911.

PROVINCE AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of Gales.	Number of Strong Winds.	Number of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Victoria .....	5195	701	...	...	...	...	Variable.
Triangle Island .....	...	...	...	...	...	...	
Prince Rupert. ....	3997	235	22	0	3	6	
Kamloops.....	2177	219	18	0	1	3	
ALBERTA.							
Sulphur Mt., Banff .....	1529	125	50	6	7	7	Southwest and West.
Calgary .....	2212	218	17	6	1	6	
Edmonton .....	2715	222	19	0	1	5	Variable.
SASKATCHEWAN.							
Hattleford .....	1819	915	37	1	1	9	South and West.
Swift Current. ....	6525	393	32	2	11	7	
Qu'Appelle .....	1871	339	22	0	5	9	
MANITOBA.							
Winnipeg.....	24 days	...	...	...	...	...	North and West.
The Pas .....	6141	172	30	1	9	6	
	1708	159	27	0	5	8	
ONTARIO.							
Port Arthur .....	8332	189	33	1	9	11	Northwest to North-east.
Parry Sound .....	6321	372	23	0	5	14	
Woodstock.....	3479	511	39	1	13	8	
Toronto .....	11,407	965	19	7	7	5	
Kingston.....	3753	266	14	0	0	7	
QUEBEC.							
Montreal .....	10188	671	12	3	13	7	Variable.
Quebec.....	9181	707	17	5	11	1	
Father Point .....	.....	.....	.....	.....	.....	.....	N. E., W. S.W.
MARITIME PROVINCES.							
Fredericton .....	6826	511	...	...	...	...	N.W., S.W.
St. John .....	9817	713	39	5	6	11	N.W., S.W.
Pt. Le Preaux .....	11670	791	50	7	5	7	N., W.
Halifax .....	9835	455	38	4	12	7	N.E., N.W.
Flat Pt .....	10835	626	39	6	8	7	N., W.
Charlottetown .....	5780	374	37	3	2	12	N., W.

## TEMPERATURE.

In central-southern British Columbia and central Nova Scotia, the mean temperature was 7° below normal. From both coasts the temperature increased inland, rising above normal in Saskatchewan, Manitoba and Ontario and reaching the maximum excess over normal of 9° at Port Arthur. There was also a northward increase from British Columbia to the Yukon, where there was an excess of 7°.

*The highest and lowest temperatures recorded in each Province during the month of February, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia,	60° at Alberni on the 28th.	—38° at Chilcotin on the 2nd.
Alberta,	62° at Macleod on the 13th.	—55° at Athabasca Landing on the 2nd.
Saskatchewan,	55° at Onion Lake on the 26th.	—42° at Lloydminster on the 2nd, Onion Lake on 2nd and 3rd, File Hills on 3rd, The Pas on the 4th.
Manitoba,	39° at Almasippi and Morden on the 24th, Stony Mountain on the 25th.	—41° at Moose Horn Bay on the 5th.
Ontario,	58° at Lakefield on the 26th.	—42° at White River and Kakabeka Falls on the 5th.
Quebec,	46° at Ste. Anne de Bellevue on the 26th.	—44° at Lake Edward on the 1st.
New Brunswick,	57° at Sussex on the 24th.	—28° at Dalhousie on the 6th.
Nova Scotia,	48° at Antigonish on the 28th.	—18° at Truro on the 13th.
P. E. Island,	40° at Charlottetown on the 1st and Hamilton on the 14th.	—11° at Charlottetown on the 13th.

## PRECIPITATION.

Precipitation was in excess of normal in southwestern Alberta, locally in eastern Saskatchewan and western Manitoba, in the Thunder Bay, Rainy River and Algoma districts, the Ottawa Valley and locally in the central-southern counties of Ontario and the southwestern portion of Quebec.

## DEPTH OF SNOW.

At the close of the month the ground was snow covered throughout Canada except on the coast and lower levels of British Columbia, and in the Peninsula of Ontario. In northern Ontario and Quebec there was about five feet of snow. In the Maritime Provinces a depth of two inches at Halifax increased to about three feet in northern New Brunswick. A large amount of snow lay on the higher levels of British Columbia, while in the Western Provinces a depth of from three to nine inches in Alberta increased to ten and twenty inches in Manitoba.

## THICKNESS OF ICE.

The thickness of ice as reported at the end of the month was as follows:—

WESTERN PROVINCES.—Battleford, 25 inches, The Pas, 21·5; Medicine Hat, 30; Swift Current, 37; Moose Jaw, 30; Qu'Appelle, 18; Minnedosa, 30.

ONTARIO.—Port Arthur, 22 inches; Southampton, 10; Port Stanley, 24; Kingston, 25·5; Toronto, 18; Barrie, 22; Ottawa, 30.

MARITIME PROVINCES.—Chatham, 18 inches; Fredericton, 27; Yarmouth, 16; Sydney, 30; Charlottetown, 25; Point Le Preaux, 18.

## BRIGHT SUNSHINE.

The duration of bright sunshine was less than is normal for February in eastern Manitoba and Ontario, but elsewhere in the Dominion was in excess of average.

## PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, FEBRUARY, 1911.

a Barometer not reduced to Sea Level. \* Stations not furnished with registering Thermometers.

STATION.	Latitude & Longitude W.	Elevation above sea level, in feet.	PRESSURE.		TEMPERATURE.					DIRECTION OF WIND FROM							VELOCITY OF WIND.				PRECIPITATION.				No. of days with 1 or more.	No. of days with 1 or more.	No. of days with 1 or more.	No. of days with 1 or more.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
			Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Date.	Mean daily range.	Mean temperature of humidity.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	C.					Total number of observations.	Mean miles per hour.	Highest daily velocity.	Date and direction from.	Amount.	Difference from average.	Heaviest fall in month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, FEBRUARY, 1911.

a Barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above sea level, in feet.	PRESSURE.			TEMPERATURE.				DIRECTION OF WIND FROM										VELOCITY OF WIND.			PRECIPITATION.			No. of days with or more.	No. of aurora.	No. of fog.		
				Mean reduced.	Highest.	Lowest.	Range.	Mean daily range.	Mean temperature of day.	Mean relative humidity.	Mean amount of cloud.	No. of days completely clouded.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	C.	Total number of observations.	Mean miles per hour.	Highest day's velocity.	Date and direction from.	Amount.				Difference from average.	Heaviest fall in month.
NEW BRUNSWICK—																															
Chatham	47	63 20	21	30.02 30.70 29.49 1.21	35.42	25.26	13.40	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Halifax	45	66 25	39	30.04 30.67 29.41 1.26	35.5	25.28	13.47	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Fredericton	45	66 25	39	30.04 30.67 29.41 1.26	35.5	25.28	13.47	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Grand Manan	46	63 46	40	30.03 30.54 29.48 1.06	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Moncton	46	63 46	40	30.03 30.54 29.48 1.06	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Point Lepreau	46	63 46	40	30.03 30.54 29.48 1.06	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
St. John	45	63 46	40	30.03 30.54 29.48 1.06	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
St. Stephen	45	63 46	40	30.03 30.54 29.48 1.06	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Sussex	45	63 38	63																												
NOVA SCOTIA—																															
Antigonish	45	63 50	50																												
Halifax	45	63 35	88	29.99 30.03 29.46 1.17	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Port Hastings	45	63 61	13																												
Parsonsboro	45	63 40	13																												
Sydney	46	63 40	13	29.93 30.04 29.33 1.31	35.7	25.7	13.0	12.8	33.0	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Sable Island, E. Point	45	63 40	13																												
St. John's	45	63 40	13																												
Windsor	44	63 41	13																												
Whitford	45	63 46	13																												
Wolfeville	45	63 40	13																												
Yarmouth	43	60 00	2	30.03 30.50 29.33 0.97	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
P. E. ISLAND																															
Charlottetown	46	43 10	38	29.98 30.04 29.48 1.16	35.4	25.2	13.4	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Charlottetown (2)	46	43 48	75																												
Hamilton	46	43 48																													
NEWFOUNDLAND																															
Amour Point	51	28 51	27	29.81 30.02 29.43 1.17	34.2	24.0	13.0	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Burke	51	28 52	17																												
Cape Norman	51	28 52	35																												
Fogo	50	43 17	30	29.78 30.05 28.98 1.07	34.0	23.8	12.8	11.2	33.0	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
Point Rich.	50	43 25	35																												
Port aux Basques	47	53 10	27	29.80 30.04 29.42 1.38	34.0	23.8	12.8	11.2	33.0	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
St. John's	47	53 12	125	29.71 30.26 29.03 1.33	34.0	23.8	12.8	11.2	33.0	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		
BERMUDA—																															
Prospect	32	47 30	151	30.17 30.40 29.92 0.48	34.5	24.0	13.0	11.3	33.3	88	1	4	0	8	2	1	0	0	8	10	17	56	8	10.0	23.0 27.5W	0.50	1.80	2.80	0.0		



PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c.,  
DURING FEBRUARY, 1911.

STATIONS.	RAINFALL.					SNOWFALL.				REMARKS.
	Amount in inches	No. of Days of or over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days.	Heaviest Fall in Month	Date.	
<b>BRITISH COLUMBIA—</b>	in.			in.		in.		in.		
Alkali Lake.....	R	1	15	R	11	2.5	2	1.7	3	
Annis.....	1.02	7	21	0.35	12	23.1	12	8.3	3	
Beaver Lake.....	1.17	9	19	0.88	12		4		2-24	
Coquitlam.....	2.67	5	23	0.79	12					
Denman's Island.....										
Ferguson.....	1.36	13	11	0.38	13	22.0	4	9.0	5	
Goldstream Lake.....	0.19	2	19	0.14	11	8.5	4	4.0	5	
Grand Forks.....	0.89	6	24	0.83	14	7.0	7	2.5	23	
Hornby Island.....						1.0	1	1.0	3	
Hydraulic.....	3.99	15	10	1.20	13	15.0	7	6.0	2	
Jordan River.....						2.5	3	1.5	5	
Jordan River (Bear Creek).....	1.89	7	10	0.80	7	35.8	11	9.0	12	
Little Qualicum (French Creek, V.I.).....	1.62	4	23	0.59	9	3.0	1	3.0	1	
Monte Creek.....						1.5	2	1.0	18	
Naas Harbour.....						29.0	8	8.0	5	
Skidegate.....	0.25	1	14	0.25	17	32.6	13	6.2	17	
Swift River Dam.....										
<b>ALBERTA—</b>										
Bardo.....										
Bismark.....						3.9	3	1.7	26	
Bruderheim.....						5.5	4	2.0	25	
Bittern Lake.....						2.8	3	1.8	2	
Bantry.....										
Brooks.....						7.4	8	3.0	26	
Conjuring Creek.....										
Count's.....										
Campsie.....						2.8	6	1.0	1	
Caldwell.....						26.9	8	6.0	2	Aurora on 1, 21, 22, 23. Fog
Dorenelee.....						3.0	3	1.0	2-26	Fog on 15. [on 17, 18.]
Elkwater.....										
Grassy Lake.....						1.0	1	1.9	26	
Jumping Pound.....						2.1	3	1.0	15	
Lacombe.....	0.00					0.0				
Langdon.....										
Loch Sloy.....						15.1	7	7.0	25	
Lineham.....						2.0	3	1.5	27	Aurora on 21, 22, 23, 24. Fog
Lyndon.....						14.1	3	6.4	24	on 5.
Minda (Many Berries Ranch).....						0.5	1	0.5	25	
Macleod.....						8.3	5	3.0	24	
Mayerhoff.....						13.5	5	5.3	2	Aurora on 21, 22, 23.
Mayton.....										Fog on 18.
Okotoks.....						6.3	4	3.5	25	
Ponoka.....						6.0	2	3.0	3-26	
Seven Persons.....										
Sion.....						3.8	4	2.0	25	
Tilley.....										Aurora on 1, 4, 5, 6, 7, 15, 16,
<b>SASKATCHEWAN—</b>										17, 18, 19, 20, 21, 22, 23, 24, 28.
Carmichael.....						11.8	5	1.5	1	
Coulece.....						3.8	2	2.8	25	
Elm How.....						3.5	3	2.0	7	
Gull Lake.....						5.0	3	3.0	23	
Hanley.....										
Kindersley.....						4.1	7	1.0	1-17	
Kelvinhurst.....						1.5	2	1.0	1	Fog on 14, 16, 17, 18.
Last Mountain.....										
Maple Creek.....						6.8	7	2.0	1	
Willow Creek.....						3.5	2	2.0	1	
<b>MANITOBA—</b>										
Cartwright.....						3.0	4	1.5	2	
Deloraine.....						6.0	4	2.5	6	Aurora on 1, 22, 23, 24, 25, 27.
Gretna.....						9.5	4	4.0	1-15	
Norquay.....						3.8	5	1.5	7	
Rapid City.....						6.1	5	3.1	2	Aurora on 21, 22, 23, 25, 26.
<b>ONTARIO—</b>										Fog on 12, 13.
Arden.....										
Deer Park.....	0.12	2	20	0.10	17	17.8	6	9.8	7	
Dutton.....	0.10	1	25	0.10	17	2.0	2	1.0	7-26	
Emsdale.....	0.27	1	16	0.27	18	8.5	11	1.8	22	
Georgetown.....	0.29	3	16	0.18	2	18.1	9	8.6	6	Aurora on 23.
Granham.....	0.40	3	16	0.26	17	15.8	9	6.0	15	
Grand Valley.....	0.06	2	14	0.03	18-27	18.0	12	5.0	7	
Goderich.....	0.10	2	22	0.20	17-27	6.0	4	3.0	1	
MacCue.....	0.10	1	24	0.10	26	6.0	3	4.0	2	
Orangeville.....	0.31	1	13	0.31	17	35.2	14	14.2	7	
Princeton.....	0.50	1	24	0.50	17	16.0	3	8.0	14	Thunder on 17.
Sydenham.....						16.0	5	6.0	6	
Strathroy.....	1.31	3	17	0.61	17	12.0	8	4.0	6	
Watford.....	0.73	4	21	0.45	14					
Westport.....						10.8	7	4.5	7	
Wooler.....						4.5	3	2.0	4-7	
Westminster.....	0.23	1	25	0.23	18	8.0	2	5.0	6	
Warton.....	0.82	2	18	0.58	17	13.5	8	3.0	6	
Wesley.....	0.41	3	12	0.31	17	15.5	13	2.0	5-14	
<b>QUEBEC—</b>										
Timiskaming.....						22.0	8	13.5	1	
Kipawa.....										
<b>NEW BRUNSWICK—</b>										
Point Escomine.....	0.40	1	24	0.40	5	3.9	3	3.2	5	Fog on 10.



MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
FEBRUARY, 1911.

STATIONS.	HOURS ENDING													
	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 a. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.
Victoria . . . . .		01	18	29	38	43	54	53	49	39	31	15		
Nanaimo . . . . .			15	21	29	37	38	32	36	38	35	16		
Vancouver . . . . .	01		10	18	25	32	35	34	37	40	38	29	02	
Agassiz . . . . .			07	20	36	33	38	39	34	38	36	17	02	
Tranquille . . . . .														
Summerland . . . . .		01	25	34	42	52	58	53	50	44	29	08		
Kamloops . . . . .			05	29	45	62	70	65	61	44	31	01		
Edmonton . . . . .			20	52	69	70	78	77	75	66	40	29		
Lethbridge . . . . .		01	32	49	67	73	62	62	55	47	31	03		
Lacombe . . . . .			10	30	41	61	63	70	70	75	72	48	02	
Medicine Hat . . . . .			18	43	57	60	61	67	67	66	57	32		
Fort Vermilion . . . . .				15	55	63	61	66	71	60	20			
Battleford . . . . .		T	25	58	76	75	74	73	67	52	19			
Indian Head . . . . .			03	15	39	47	61	71	68	65	57	23		
Moosejaw . . . . .		01	10	25	51	68	75	79	78	69	61	33		
Rosthern . . . . .			09	50	63	73	75	76	73	65	65	54	03	
Brandon . . . . .		01	32	42	63	67	69	72	64	61	51	04		
Winnipeg . . . . .			15	27	43	49	48	56	60	54	51	53	02	
Haileybury . . . . .		T	10	28	37	43	38	40	41	40	36	20	01	
Woodstock . . . . .			14	15	19	39	39	43	40	41	35	18	01	
Lindsay . . . . .			07	22	31	39	40	41	42	38	15	04		
Barrie . . . . .			13	19	25	27	31	39	39	38	29	08		
Toronto . . . . .				12	22	32	31	37	31	30	32	05		
Kingston . . . . .		05	29	35	41	41	43	46	34	26	15	15	02	
Ottawa . . . . .			28	18	46	46	46	49	49	41	35	19		
Montreal . . . . .			04	20	31	35	38	58	34	18	06			
Quebec . . . . .			23	36	45	54	58	59	58	56	52	26		
Sherbrooke . . . . .			01	11	29	31	17	51	47	50	47	39	15	
Fredericton . . . . .			02	34	63	68	65	65	61	61	63	59	46	03
Charlottetown . . . . .			21	38	53	66	65	63	57	50	52	38	03	

	Victoria.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Ft. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Rosthern.	Brandon.	Winnipeg.	Haileybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.
Registered duration in hours.	101	83	85	85		110	116	164	136	152	119	116	115	130	155	169	139	123	93	82	78	76	83	92	114	63	131	106	106	111
Percentage of possible duration %.....	37	29	30	30		39	33	60	48	55	53	15	53	46	55	61	49	44	33	28	30	26	28	32	39	25	46	36	57	49
Difference from average	+ 9	+ 2		+ 8									+ 1	- 9		+ 2	- 1		- 2	- 5	- 2	- 8	- 1	- 2	- 5	+ 10		- 11	+ 10	
Maximum percentage in one day .....	94	90	97	81		89	80	92	89	97	92	75	83	87	95	98	92	94	86	87	74	81	86	91	91	96	89	91	96	95
Date of maximum .....	28	26	26	26		27	26	28	23	23	8	18	15	21	26	21	26	26	12	28	19	5	5	5	19	5	11	15	28	6
No. of days completely clouded.....	4	13	11	12		6	4	2	3	2	2	1	1	2	2	4	1	8	5	10	11	9	8	11	8	11	5	6	3	3

*Aurora recorded:—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Waitefield, IV; Aweme, III; Aitkensville, IV; Ninga, Cartwright, III; Sion, II; Campsie, III.
- Fort Vermilion, Fort St. James.
2. Pembina, Aweme, III.
3. Pembina, Fort Vermilion.
4. Pembina, Schreiber, IV; Aitkensville, IV; Sion.
5. Schreiber, IV; Sion.
6. Sion, Crescent Lake, IV; Fort Vermilion.
7. Threehills Creek, II; Waitefield, II; Sion, Peace River Crossing, IV.
9. Spirit River.
10. Spirit River.
12. Brownhill, IV.
13. Grand Manan, IV.
14. Grand Manan, IV; Fort Vermilion.
15. Pembina, Sion.
16. Waitefield, IV; Aitkensville, IV; Sion.
17. Hillsdown, IV; Threehills Creek, II; Waitefield, III; Aitkensville, III; Sion, Peace River Crossing, IV; Fort Vermilion.
18. Hillsdown, IV; Threehills Creek, IV; Pembina, Waitefield, IV; Schreiber, IV; Aitkensville, IV; Bruce Mines, IV; Treherne, III; Quebec, IV; Sion, III; File Hills, Muenster, IV; Fort Vermilion.
19. Pembina, Aweme, IV; Minnedosa, IV; Sion, Brownlee, Luseland, Saltecoats, III.
20. Brandon, Threehills Creek, I; Pembina, Waitefield, III; Schreiber, IV; Aweme, III; Aitkensville, IV; Brandon, Bruce Mines, IV; Treherne, IV; Gravenhurst, IV; Sion, III; Crescent Lake, IV; Chaplin, IV; Luseland, Muenster, IV; Melfort, IV; Oliver, Prince, II; Waseca, Stanley, IV; Fort Vermilion, Fort St. James; Haileybury III.
21. Hillsdown, III; Halkirk, Gilt Edge, IV; Alix, Loch Sloy, Threehills Creek, I; Lunnford, Waitefield, I; Schreiber, IV; Aweme, I; Aitkensville, I; Rapid City, Macleod, Kakabeka Falls, I; Bruce Mines, I; Treherne, III; Truro, IV; Minnedosa, IV; Sydney, I; Grand Manan, IV; Charlottetown, IV; Sion, II; Brownlee, Crescent Lake, III; Chaplin, I; Estevan, II; Foxleigh, Luseland, Glenbryan, I; Muenster, I; Melfort, IV; Oliver, Prince, I; Waseca, Saltecoats, III; Campsie, III; Stanley, IV; Fort Vermilion, Fort St. James; Wolfville III.
22. Hillsdown, III; Halkirk, Gilt Edge, II; Loch Sloy, Threehills Creek, II; Pembina, Waitefield, I; Schreiber, III; Aweme, I; Aitkensville, II; Carberry, Rapid City, Cartwright, II; Macleod, Lake Talon, Kakabeka Falls, IV; Montague, Treherne, IV; Gravenhurst, IV; Truro, IV; Quebec, IV; Minnedosa, I; Sion, II; Peace River Crossing, IV; Crescent Lake, IV; Chaplin, II; Foxleigh, Lloydminster, Luseland, Glenbryan, I; Muenster, IV; Melfort, IV; Oliver, Waseca, Saltecoats, III; Campsie, I; Stanley IV; Fort Vermilion, Fort St. James; Haileybury IV.
23. Hillsdown, III; Loch Sloy, Threehills Creek, III; Pembina, Lunnford, Waitefield, III; Schreiber, IV; Aweme, II; Aitkensville, III; Rapid City, Cartwright, III; Macleod, Treherne, IV; Minnedosa, I; Sion, III; Peace River Crossing, IV; Brownlee, Crescent Lake, IV; Chaplin, II; Foxleigh, Lloydminster, Luseland, Glenbryan, I; Prince, IV; Campsie, II; Dawson, IV; Spirit River, Fort Vermilion, Fort St. James.
24. Hillsdown, IV; Alix, Brandon, Loch Sloy, Threehills Creek, III; Pembina, Waitefield, II; Aweme, IV; Aitkensville, III; Carberry, Brandon, Cartwright, IV; Chicoutimi, Minnedosa, I; Sion, Foxleigh, Prince, II; Waseca, Dawson, IV; Spirit River.
25. Threehills Creek, III; Waitefield, IV; Aweme, IV; Rapid City, Cartwright, IV; Treherne, IV; Almasippi, Stonecliffe, II; Brownhill, III; File Hills, Crescent Lake, IV; Foxleigh, Oliver, Prince, III; Waseca; Dawson, IV; Spirit River; Haileybury IV.
26. Hillsdown, IV; Threehills Creek, III; Pembina, Waitefield, II; Aweme, I; Aitkensville, III; Rapid City, Treherne, IV; Almasippi, Minnedosa, I; Peace River Crossing, IV; Brownlee, Crescent Lake, IV; Chaplin, II; Melfort, IV; Prince, III; Waseca, Saltecoats, IV; Fort Vermilion.
27. Halkirk, Gilt Edge, III; Threehills Creek, III; Pembina, Waitefield, II; Aweme, I; Aitkensville, III; Cartwright, IV; Lake Talon, IV; Lakefield, Almasippi, Chicoutimi, Quebec, IV; Winnipeg, II; Chaplin, II; Glenbryan, I; Muenster, IV; Melfort, IV; Oliver, Prince, IV; Saltecoats, IV; Haileybury III.
28. Pembina, Georgetown, III; Montague, Clinton, I; Lucknow, IV; Chicoutimi, Truro, IV; Quebec, III; Sion, III; Crescent Lake, IV; Luseland, Prince, IV; Dawson, IV; Babine Lake; Haileybury IV; Wolfville IV.

*Thunder recorded:*

4. Yarmouth.
17. Port Burwell, Birnam, Princeton, Port Stanley.
24. Bermuda.

## FORECASTS FOR FEBRUARY, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1151. These were divided as follows :

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta .....	78	53	20	5	80.7
Saskatchewan .....	79	58	15	6	82.9
Manitoba .....	79	62	13	4	86.7
Lake Superior .....	96	74	20	2	87.5
Lower Lake Region .....	106	86	17	3	89.1
Georgian Bay .....	106	83	20	3	88.6
Ottawa Valley .....	98	75	17	6	85.2
Upper St. Lawrence .....	98	74	20	4	85.7
Lower St. Lawrence .....	98	79	11	8	89.2
Gulf .....	98	75	19	4	86.2
Maritime Provinces West .....	108	87	16	5	88.0
Maritime Provinces East .....	108	85	18	5	87.0
Total .....	1151	891	206	54	86.1

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto,  
April 28, 1911.



DEPARTMENT OF MARINE AND FISHERIES, CANADA.

METEOROLOGICAL SERVICE.

# Monthly Weather Review.

VOL. XXXV.

MARCH, 1911.

No. 3.

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## GENERAL SYNOPSIS.

On the southwestern extremity of Vancouver Island and on the Queen Charlotte Islands, the mean temperature of March was somewhat less than normal. Elsewhere in the Province of British Columbia the month was warmer than the average, by  $1^{\circ}$  to  $3^{\circ}$  in the western and central portions and by  $5^{\circ}$  to  $6^{\circ}$  in the extreme southeastern portion, where conditions during the month were similar to those which obtained in Alberta. During the first week temperatures were quite low. Zero to  $9^{\circ}$  below was recorded on the higher levels to the east on the first two days, and  $10^{\circ}$  to  $25^{\circ}$  above zero on the lower levels to the west and on the coast. The maximum temperatures varied between  $42^{\circ}$  and  $70^{\circ}$ , but  $60^{\circ}$  was reached at the majority of the stations on the 18th, 22nd or 30th. The precipitation of the month appeared to be deficient on Vancouver and on the lower mainland, but in excess of the normal in the Cariboo district.

In the Western Provinces the weather of March was very mild. The mean temperature in Alberta and Saskatchewan exceeded the normal by from  $8^{\circ}$  to  $13^{\circ}$  and in Manitoba by from  $7^{\circ}$  to  $9^{\circ}$ . In Alberta temperatures of zero or below occurred on an average of three days only during the month, and at many points not at all. The latter half of the month was very mild. Between the 21st and 24th temperatures ranging from  $50^{\circ}$  to  $70^{\circ}$  were recorded, while  $84^{\circ}$  were registered at Medicine Hat on the 23rd. The total precipitation in Alberta was much less than normal, except at Calgary.

The lowest temperatures of the month occurred on the 4th, 5th, 14th and 15th, in Saskatchewan, when from  $3^{\circ}$  to  $9^{\circ}$  below zero were recorded. On 18 to 20 days the maximum temperatures were above the freezing point, while the highest readings of the month were, at many stations, between  $50^{\circ}$  and  $65^{\circ}$ . Very few places reported precipitation on more than three days, and the total fall was very much less than usual.

In Manitoba conditions were much the same as in Saskatchewan, although the maximum temperatures were in most instances not so high. The precipitation occurred on from one to three days in the western portion of the province and on seven days in the eastern, but was in all instances considerably less than normal.

The western Lake Superior districts experienced weather conditions similar to those which obtained in Manitoba, the mean temperature exceeding the average by  $7^{\circ}$ , while the precipitation was very scanty. In the Niagara peninsula the mean temperatures were  $1^{\circ}$  or less below average, and in Essex county about  $2^{\circ}$  below. In the remainder of that portion of Ontario, lying between the Georgian Bay, Lake Huron and Lake Erie, the normal temperature was exceeded by from  $1^{\circ}$  to  $3^{\circ}$ . In the counties lying between Lake Ontario, the Ottawa and Upper St. Lawrence rivers, less than average was recorded, the deficiency ranging from  $2^{\circ}$  at Peterborough, Prince Edward County and Kingston to  $4^{\circ}$  at Ottawa. The precipitation was either average or in excess in the peninsula of Ontario, but was deficient elsewhere in the province.

In the Gulf counties of Quebec temperature conditions were nearly normal throughout the month, but along the Middle St. Lawrence and in the Eastern Townships the month was colder than usual by about  $3^{\circ}$ . In the Eastern Townships the precipitation was in excess of the normal quantity, but

elsewhere was deficient. From the 1st to the 9th, and from the 16th to the 20th, temperatures considerably below zero were registered throughout the province. The 26th, 27th and 28th were the mildest days of the month, temperatures ranging on those days from 45° to 50°.

The month was colder than usual in the Maritime Provinces, with mean temperatures from 3° to 4° below normal. Except locally on the Bay of Fundy, the precipitation was less than average.

#### ATMOSPHERIC PRESSURE

The mean value of the atmospheric pressure for March was below the normal throughout Canada, except in southern and southwestern British Columbia, where the average was exceeded. Departures from average were generally more than a tenth of an inch in the Western Provinces and northern districts of Ontario and Quebec, and that difference was positive over southern parts of Vancouver Island.

The range of departure was 0.29 of an inch, with extremes of -0.19 of an inch at Battleford, Sask., and 0.10 of an inch at Victoria, B.C.

#### HIGH AREAS.

Twelve systems of high pressure were traced; five first appeared in the vicinity of the Yukon Territory, one on the coast of Northern British Columbia, two in Northern Saskatchewan, and four on the United States Pacific coast. Many of the systems were pronounced and in their passage over the continent they usually covered great areas. Their general path was either over or to the southward of the Great Lakes, thence off the Middle Atlantic United States Coast and out to sea. The presence of such a large number of high pressure systems, accompanied as they were, for the most part, by low temperatures, tended to keep the weather very backward generally.

#### LOW AREAS.

Sixteen areas of low pressure were charted; six first appeared on the Alaskan coasts, three on the coast of Northern British Columbia, one each in Northern and Southern Alberta, one on the Middle United States Pacific coast, one in the Gulf of Mexico and three off the Atlantic seaboard. The depressions from the Northwest and West all traversed the continent between the 50th and the 35th parallels of latitude, the larger number ultimately sweeping across the Maritime Provinces and Newfoundland, where they caused frequently recurring stormy conditions. The others passed northeastwards far out to sea, their accompanying bad weather being pretty well confined to Newfoundland.

#### WINDS, MARCH, 1911.

PROVINCE AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of Gales.	Number of Strong Winds.	Number of Fresh Winds.	GENERAL DIRECTION.
<b>BRITISH COLUMBIA.</b>							
Victoria .....	5194	418	37	3	4	12	S. to W.
Prince Rupert .....	4046	475	35	1	3	6	E. S.
Kamloops .....	3546	386	24	0	2	7	Variab.
Triangle Island .....	10914	813	54	1			
<b>ALBERTA.</b>							
Sulphur Mt., Banff .....	15284	1122	68	6	11	3	S. to W.
Edmonton .....	4969	284	26	0	7	12	N. W. to N. W.
<b>SASKATCHEWAN.</b>							
Prince Albert .....	5175	398	31	1	4	12	S. E., S. W., N. W.
Battleford .....	8614	590	59	7	7	9	S. E., W., N. W.
Swift Current .....	9667	554	44	3	19	5	S. E., W., N. W.
Qu'Appelle .....	6891	380	24	0	7	16	S. W., N. W.
<b>MANITOBA.</b>							
Winnipeg .....	11382	699	43	5	16	7	N. W.
The Pas .....	6931	600	49	2	7	7	E. S., W.
<b>ONTARIO.</b>							
Port Arthur .....	8826	557	33	4	14	11	S. W., W., N.
Woodstock .....	8423	540	28	1	12	10	S. E., S. W., N. W.
Perry Sound .....	640	388	21	0	4	21	S. E., S. W., N. W.
Toronto .....	1078	619	45	6	10	10	E. W., N. W.
Kingston .....	3669	187	11	0	0	9	N. E., S. E., S. W.
<b>QUEBEC.</b>							
Montreal .....	12267	685	39	5	10	8	S. E., S. W.
Quebec .....	9620	938	60	4	11	10	S. W., W.
Father Point .....	11119	955	65	7	7	7	S. W., N. W.
<b>MARITIME PROVINCES.</b>							
Pt. Le Preaux .....	13237	924	53	5	9	3	S. W., N. W., N.
St. John .....	16843	718	52	5	12	7	S. E., S. W., N. W.
Fredericton .....	6889	471					S. W., W., N. W.
Halifax .....	10058	638	46	5	9	8	S. W., W., N. W.
Flat Pt. .....	11658	659	44	5	14	6	S. W., W., N. W., N.
Charlottetown .....	6014	605	30	3	6	10	S., W.

## TEMPERATURE.

Over the greater part of British Columbia the mean temperature of March was higher than normal; by  $1^{\circ}$  to  $3^{\circ}$  in the western and central portion, and by  $5^{\circ}$  to  $6^{\circ}$  in the extreme southeast. The month was very mild in the Western Provinces and the Lake Superior districts of Ontario, the mean temperatures exceeding average by from  $7^{\circ}$  to  $13^{\circ}$ . In the Niagara peninsula and the greater part of Eastern Ontario, the month was colder than usual by from  $1^{\circ}$  to  $4^{\circ}$ , in western and central Quebec and the Maritime Provinces by from  $3^{\circ}$  to  $4^{\circ}$ .

*The highest and lowest temperatures recorded in each Province during the month of March, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia,	$70^{\circ}$ at Alberni on the 14th,	$-29^{\circ}$ at Atlin on the 10th.
Alberta,	$84^{\circ}$ at Medicine Hat on the 23rd,	$-25^{\circ}$ at Peace River Crossing on the 11th.
Saskatchewan,	$64^{\circ}$ at Glenbryan on the 21st,	$-25^{\circ}$ at File Hills on the 3rd.
Manitoba,	$58^{\circ}$ at Morden on the 24th & 25th,	$-22^{\circ}$ at Oakbank on the 4th.
Ontario,	$61^{\circ}$ at Wallaceburg on the 26th,	$-38^{\circ}$ at White River on the 3rd.
Quebec,	$52^{\circ}$ at Abitibi on the 26th,	$-38^{\circ}$ at Lake Edward on the 4th.
New Brunswick,	$52^{\circ}$ at St. Stephen on the 26th and Moncton on the 27th,	$-16^{\circ}$ at Dalhousie on the 4th.
Nova Scotia,	$58^{\circ}$ at Port Hastings on the 30th,	$-12^{\circ}$ at Antigonish on the 7th.
P. E. Island,	$49^{\circ}$ at Hamilton on the 31st,	$-8^{\circ}$ at Charlottetown on the 5th.

## PRECIPITATION.

Except in the Cariboo district and locally in the mountainous portion of the province, the precipitation was less than normal in British Columbia. Over the remainder of the Dominion the amount was very scanty, especially in the Western Provinces, where in some districts precipitation occurred on one or two days only. The Peninsula of Ontario reported amounts which were normal or slightly above, as did also stations on the Bay of Fundy, but elsewhere the precipitation was deficient.

## SNOW ON THE GROUND.

At the close of the month the whole of the Province of Quebec and most of northern Ontario were well covered with snow, while in other parts of the Dominion there was no snow except in the wooded portions.



## STATION.

[illegible]











PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, MARCH, 1911.

\* Stations not furnished with Registering Thermometers.  
a barometer not reduced to Sea Level.

[illegible]



PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c.,  
DURING MARCH, 1911.

STATIONS.	RAINFALL.					SNOWFALL.				REMARKS.
	Amount in inches	No. of Days '01 or over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA—										
Alkali Lake.....										
Annis.....	1.27	9	22	0.12	23					
Beaver Lake.....	1.62	6	25	0.75	23					
Coquitlam.....	5.11	7	24	2.21	23					
Denman's Island.....	0.69	4	27	0.29	23					
Ferguson.....	0.45	2	22	0.41	23	30.5	7	7.5	24	
Goldstream Lake.....	3.81	9	22	1.62	24					
Grand Forks.....	0.11	2	28	0.06	7	1.0	1	1.0	4	
Hydraulic.....										
Hornby Island.....	0.36	3	28	0.30	7					
Jordan River.....	3.90	11	20	1.10	24					
Jordan River (Bear Creek).....	1.80	10	18	1.41	9	7.9	3	5.4	25	
Little Qualicum (French Creek, V.I.).....	0.15	4	27	0.18	23					
Monte Creek.....	0.28	1	30	0.28	25					
Naas Harbour.....										
Skidegate.....	4.60	16	15	0.89	12					
ALBERTA—										
Bardo.....						1.0	1	1.0	7	
Bismark.....	0.16	1	27	0.16	28	3.3	3	1.2	11	
Bruderheim.....	0.10	3	24	0.04	24-28	3.0	1	1.0	2-13	
Bittern Lake.....	0.21	3	26			1.0	2	0.5	2-11	
Bantry.....										
Brooks.....	0.13	2	28	0.08	29	1.5	1	1.5	3	
Conjuring Creek.....										
Courts.....										
Campsie.....	0.13	2	24	0.12	28	3.0	5	1.0	3	Aurora on 1, 2.
Caldwell.....						6.5	6	6.0	25	Fog on 14, 21
Dorence.....	0.35	1	29	0.35	30	1.0	1	1.0	2	
Elkwater.....										
Grassy Lake.....						2.0	2	1.0	3-31	
Jumping Pound.....						6.5	5	2.5	31	
Lacombe.....	0.31	1	27	0.31	28	9.5	3	1.5	31	
Langdon.....										
Loch Sloy.....						8.0	10	2.0	31	Aurora on 20.
Lyndon.....						5.5	3	4.4	31	
Lincham.....						1.8	2	1.3	31	
Macleod.....						1.0	1	1.0	31	
Minda (Many Berries Ranch).....						1.5	2	1.3	30	
Mayeroff.....	0.25	5	23	0.09	10	2.0	3	1.0	11	Fog on 14, 21.
Mayton.....										
Okotoks.....						3.2	4	2.0	30	
Ponoka.....	0.30	1	28	0.30	27	1.4	2	1.0	29	
Sion.....	0.10	2	19	0.18	23	13.0	10	3.0	30	Aurora on 1, 16, 17, 18, 19, 20, 21, 24, 28.
Seven Persons.....										
Tilley.....										
Wabamun.....										
SASKATCHEWAN—										
Carmichael.....						5.5	2	3.5	4	
Coule.....										
Elm How.....						1.0	2	0.5	29-30	
Forks Swift Current (Gull Lake).....	0.02	1	30	0.02	30					
Gull Lake.....						3.3	3	1.5	2	
Hunley.....										
Kindersley.....										
Kelvinhurst.....	0.00					0.0				
Last Mountain.....										
Maple Creek.....	0.02	1	24	0.02	31	2.8	6	1.5	3	
Willow Creek.....	0.00					0.0				
MANITOBA—										
Cartwright.....	0.60	2	26	0.50	29	2.5	3	2.0	16	Aurora on 19, 20, 21, 24, 26.
Deloraine.....										
Gretna.....						0.5	1	0.5	18	
Norquay.....						2.8	4	1.0	1	
Rapid City.....						2.4	6	0.6	16	Aurora on 19, 20, 28.
ONTARIO—										
Arden.....										
Deer Park.....	1.20	3	23	0.61	27	1.3	5	1.3	17-29	
Dutton.....	0.80	3	24	0.50	26	8.0	4	4.0	29	
Emisdale.....	0.52	3	17	0.29	28	20.3	11	4.5	22	Aurora on 23, 24, 25, 28.
Goderich.....	0.90	3	18	0.30	9-27	33.0	10	9.0	15	
Georgetown.....	1.67	5	15	0.79	27	9.2	11	2.2	6	Aurora on 20, Thunder on 11
Grantham.....	1.05	5	18	0.52	10	13.2	8	5.0	3	
Grand Valley.....	1.25	5	15	0.10	28	13.5	11	2.5	6-31	
MacCue.....	0.63	3	22	0.33	27	11.0	6	5.0	22	
Orangeville.....	0.76	2	21	0.54	27	14.9	8	5.1	6	
Princeton.....	1.22	3	23	0.65	27	14.5	5	4.0	18-30	
Sydenham.....	0.35	1	26	0.35	11	9.5	4	3.0	31	
Strathroy.....	1.20	3	22	0.63	27	12.5	6	1.0	15-30	
Watford.....	2.25	7	24	0.75	27					
Westport.....	0.50	2	22	0.25	20-27	15.3	7	3.0	22	Thunder on 20, 27.
Wooler.....	1.80	3	24	0.73	27	9.0	4	3.0	17-30	
Westminster.....	0.77	3	24	0.15	27	10.0	4	3.0	5-31	
Warton.....	1.66	5	22	0.50	27	11.5	4	5.0	5	Thunder on 11.
Wesley.....	1.62	6	14	0.62	10	16.5	11	4.0	6	
QUEBEC—										
Timiskaming.....	1.53	6	25	0.60	27					
Kipawa.....										
Quinze Dam.....	0.90	1	22	0.90	27	16.5	8	3.3	22	
NEW BRUNSWICK—										
Point Escomiac.....	0.34	3	23	0.17	28	19.2	5	9.7	23	



MEAN PROPORTION OF BRIGHT SUNSHINE, REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
MARCH, 1901

STATIONS.	Hour Ending											
	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.
Victoria	63	37	40	47	54	61	61	61	71	74	60	60
Nanaimo	71	32	50	58	61	61	66	67	63	55	41	67
Vancouver	..	44	44	50	48	54	62	65	58	51	44	48
Agassiz	..	45	48	50	52	50	61	65	62	40	24	46
Tranquille	62	26	53	65	60	66	66	63	68	66	53	68
Summerland	45	46	67	67	70	69	66	71	69	64	48	62
Kamloops	..	30	63	70	66	71	67	68	71	65	59	61
Edmonton	68	38	58	61	65	69	74	73	65	61	41	62
Lethbridge	70	41	60	63	62	68	66	61	60	59	64	..
LaCombe	62	24	41	65	65	65	65	63	65	52	31	62
Medicine Hat	..	27	50	57	63	60	68	61	57	44	22	..
Fort Vermilion	..	16	56	61	62	60	61	58	50	42	22	..
Battleford	..	41	59	57	63	66	69	71	66	59	57	46
Indian Head	..	24	47	61	70	71	71	67	68	63	32	..
Moosejaw	46	43	64	70	63	66	69	67	70	65	48	45
Rosethorn	63	33	47	54	69	67	72	69	67	63	57	64
Brandon	65	31	56	66	71	67	66	67	65	54	39	45
Winnipeg	62	22	32	32	54	61	63	72	73	60	50	65
Hanleybury	19	45	56	55	61	59	61	63	64	56	51	22
Woodstock	..	30	43	42	45	51	52	54	48	45	27	67
Lindsay	61	69	37	51	56	54	57	50	50	46	37	24
Barrie	43	26	46	54	55	58	54	57	50	54	35	65
Toronto	..	48	48	56	59	58	61	65	57	48	40	67
Kingston	43	26	54	56	57	57	56	54	50	46	32	64
Ottawa	19	44	53	57	63	70	58	59	57	57	20	..
Montreal	63	26	46	50	49	48	48	47	39	25	64	61
Quebec	60	31	43	53	58	59	55	58	54	51	43	64
Sherbrooke	40	39	55	58	61	65	55	60	45	42	38	69
Fredericton	68	46	55	57	58	61	65	60	65	58	46	47
Charlottetown	63	29	39	53	55	58	59	61	61	55	40	60
Dunvegan, Alta.	63	17	52	43	56	51	47	43	40	36	20	..

	Victoria.	Nanaimo.	Vancouver.	Agassiz	Tranquille	Summerland.	Kamloops.	Edmonton.	Lethbridge.	LaCombe.	Medicine Hat.	Fort Vermilion.	Battleford.	Indian Head.	Moosejaw	Rosethorn.	Brandon.	Winnipeg.	Hanleybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.	Dunvegan.
Registered duration in hours.	182	172	154	113	180	207	191	191	160	168	160	151	155	179	198	18	187	173	187	137	119	158	161	161	189	324	150	163	185	157	120
Percentage of possible duration	49	47	42	30	50	56	52	52	44	46	45	41	42	49	54	50	51	47	51	37	40	43	43	51	37	43	44	50	43	33	
Difference from average	+11			-11										15			8	2		3	2	5	9	16	+23	8	+2		+3		
Maximum percentage in one day	58	89	84	84	84	88	85	87	79	87	83	74	77	82	86	80	91	87	86	62	62	89	80	86	93	100	91	93	97	91	76
Date of maximum	16	1	1	1	3	20	3	1	1	19	1	1	12	13	18	14	25	31	13	13	24	24	13	6	24	24	14	13	5	1	16
No. of days completely clouded.	4	4	3	5	4	3	5	9	3	1	1	1	1	2	1	2	2	8	6	9	6	4	1	1	8	6	9	6	6	3	8

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Sion, III : Campsie, I; Pembina; Fort St. James.
2. Campsie, III : Montague; Fort Vermilion.
3. Waitefield, II: Aitkensville, IV; Schreiber, IV; Quebec, IV; Haileybury, IV.
4. Melfort, IV; Prince, IV; Montague, Quebec, IV; Dawson, IV; Lake Talon.
5. Pembina, Oliver, Aitkensville, IV; Fort Vermilion.
6. Alix.
12. Prince, IV.
14. Sion.
15. Pembina, Prince, II : Spirit River.
16. Sion; Fort Vermilion : Spirit River.
17. Sion, Oliver, Prince, IV; Waitefield, IV; Fort Vermilion : Spirit River.
18. Sion, Prince, II : Spirit River.
19. Sion, Cartwright, II; Rapid City, I; Chilcote, I; Chilliwack, III; Okanagan Mission, Princeton, III; Salmon Arm, Foxleigh, Summerland, Hillsdown, IV; Halkirk, Threehills Creek, II; Waitefield, III; Esterhazy, III; Chaplin, IV; Esteven, II; Oliver, Glenbryan, I; Melfort, IV; Muenster, IV; Pense, III; Brandon, Treherne, IV; Aweme, III; Lucknow, IV; Kakabeka Falls, II; Clinton, III; Winnipeg, I; Crescent Lake II; Boutin III; Spirit River; Barrie, IV.
20. Loch Sloy, Sion, III; Cartwright, III; Rapid City, I; Georgetown, III; Esterhazy, III; Chaplin, IV; Glenbryan, I; Muenster, IV; Oliver, Treherne, IV; Aweme, IV; Schreiber, IV; Lucknow, IV; Kakabeka Falls, III; Haliburton, Clinton, III; Minnedosa, I; Grand Manan, IV; Fort Vermilion, Gravenhurst, III; Haileybury, III; Crescent Lake IV.
21. Sion, III; Cartwright, IV; Summerland, Hillsdown, IV; Halkirk, Pembina, Pakan, IV; Threehills Creek, IV; Waitefield, II; Foxleigh, Brownlee, Chaplin, IV; Grenfell, II; Glenbryan, I; Melfort, IV; Muenster, II; Oliver, Prince, I; Aweme, II; Birnam, III; Port Arthur, II; Minnedosa, IV; Quebec, III; Father Point, II; Grand Manan, IV; Fort Vermilion; Crescent Lake IV; Boutin II.
22. Hillsdown, IV; Halkirk, Pembina, Threehills Creek, IV; Chaplin, IV; Oliver, Aweme, IV.
23. Emsdale, III; Melfort, IV; Oliver, Prince, IV; Pense, III; Aitkensville, IV; Aweme, III; Montague, Quebec, IV; Father Point, III; Dawson, IV; Fort Vermilion, Gravenhurst, IV; Haileybury, III; Crescent Lake IV; Lake Talon.
24. Sion, III; Cartwright, IV; Emsdale, IV; Waitefield, II; Esterhazy, III; Melfort, IV; Muenster, II; Oliver, Quebec, IV; Aitkensville, II; Aweme, III; Stony Creek, II; Port Dover, IV; Montague, Madoc, III; Lucknow, IV; Haliburton, Minnedosa, II; Bruce Mines, IV; Chicoutimi, Grand Manan, IV; Dawson, IV; Fort Vermilion, Gravenhurst, II; Crescent Lake III; Deloraine; Lake Talon IV.
25. Emsdale, III; Glenbryan, II; Melfort, IV; Muenster, IV; Oliver, Schreiber, IV; Minnedosa, I; Fairview (brilliant), Fort Vermilion; Crescent Lake III; Boutin III.
26. Cartwright, IV; Chilliwack, II; Threehills Creek, III; Esterhazy, II; Esteven, IV; Muenster, III; Aitkensville, IV; Chicoutimi, Winnipeg, II; Minnedosa, IV; Grand Manan, IV; Dawson, IV; Fort St. James; Boutin II.
27. Chilcote, II; Summerland, Threehills Creek, IV; Glenbryan, I; Prince, IV; Aitkensville, III; Schreiber, IV; Minnedosa, I; Dawson, IV; Crescent Lake III.
28. Sion, II; Rapid City, II; Emsdale, IV; Esterhazy, III; Muenster, IV; Aweme, II; Port Arthur, I; Stonecliffe, II; Fort Vermilion, Gravenhurst, IV; Haileybury, II.
29. Muenster, IV; Haileybury, IV; Ninga; Boutin IV.
30. Dawson, IV.
31. Dawson, IV.

*Thunder recorded :*

10. Port Stanley.
11. Warton, Georgetown, Agincourt, Point Clark, Peterboro', Paris, Midland, Lakefield, Lucknow, Kinnmount, Haliburton, Elora, East Toronto, Toronto, Southampton; Barrie.
20. Westport.
21. Georgetown.
27. Wooler, Westport, Madoc, Clinton, Bloomfield, Birnam.
30. Windsor, N.S.
31. Wolfville, N.S.

## FORECASTS FOR MARCH, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1222. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta	81	64	15	2	88.3
Saskatchewan	82	68	12	2	90.2
Manitoba	82	60	10	3	90.2
Lake Superior	91	77	11	3	89.1
Lower Lake Region	110	89	17	4	88.6
Georgian Bay	108	79	21	8	82.9
Ottawa Valley	104	78	16	10	82.7
Upper St. Lawrence	114	82	14	8	85.6
Lower St. Lawrence	107	83	16	8	85.6
Gulf	108	86	16	6	87.0
Maritime Provinces West	121	95	20	6	86.8
Maritime Provinces East	121	92	21	8	84.7
Total	1222	962	192	68	86.6

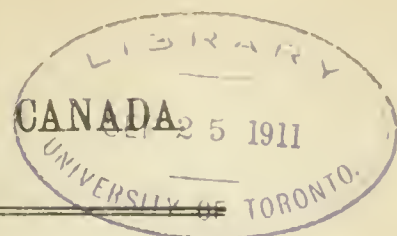
In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto,  
May, 1911.





# Monthly Weather Review.

VOL. XXXV.

APRIL, 1911.

No. 4.

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## GENERAL SYNOPSIS.

The month began with very cool weather in British Columbia, especially in the Cariboo district, where temperatures below zero were registered on the 3rd. Snow fell during the first two weeks on one to three days in the more northerly latitudes and on the higher levels. The latter part of the month was much warmer, maximum temperatures ranging between 70° and 80° during the last week. The precipitation was very much less than normal on the coast and exceeded the average at very few points in the interior, except in the Cariboo district, where the excess was small.

In Alberta temperatures on the first day of the month were at the freezing point or nearly so, but decreased to zero on the third day, and to 10° to 20° below zero on subsequent days, until the 8th. A milder period intervened till the 13th and 14th, when temperatures were again zero or nearly so. From the 16th to the end of the month more seasonal weather obtained, the highest readings of the month, ranging from 75° to 80°, being registered between the 21st and 25th. In the foot-hills of the Rockies, in the southwestern portion of the province, the precipitation was in excess of normal by about one-third, but elsewhere in Alberta there was a deficiency, rain or snow falling on but two days in many districts.

Temperature conditions in southwestern Saskatchewan were very similar to those which obtained in Alberta, but in the northern and eastern portions of the province the latter part of the month was much warmer while the first few days were not so severely cold, many places registering no temperatures below zero during the month. Precipitation was in excess of the normal amount in the central and southwestern districts but elsewhere was deficient.

Milder weather was experienced in Manitoba than in the other western provinces. The only cold period occurred during the first week, the lowest temperature, about 3°, being registered on the 3rd. After the 7th the temperature rose from the freezing point to 50° on the 9th and to 60° on the 11th. The remainder of the month was generally moderately warm, but on the 13th and 14th the temperature fell to zero, and a heavy fall of snow occurred in many districts, disappearing from the ground, however, in a few hours. On the 27th, 28th and 29th, maximum temperatures of 80° and higher, were registered.

The weather of the month was generally cool in Ontario, although no severe frosts occurred in southern Ontario after the first few days. In the Lake Superior districts and in the Porcupine country temperatures below zero were registered early in the first week, but the remainder of the month was free from cold periods. In the northern portions of the province snow fell towards the close of the first week, while showers occurred frequently in the southern counties. During the last week maximum temperatures exceeded 70° everywhere, and in northern and northeastern Ontario reached or exceeded 80°. In the counties of the extreme southwest, where showery weather was of very frequent occurrence during the month, the normal amount of precipitation was well exceeded, but elsewhere in the province there was a general deficiency.

Cool weather with little precipitation prevailed in Quebec province during the greater part of the month. Temperatures of 55° to 60° were recorded in some places about the 13th and 14th, but it

was generally much cooler until the last three days of the month, when 75° to 80° were registered. The deficiency of precipitation amounted to from one-third to one-half of the normal fall.

The weather was not seasonal in the Maritime Provinces, but was in fact almost wintry during the greater part of the month. As late as the third week temperatures did not exceed 35°, while snow fell to a considerable depth on the 5th, 9th, 21st and 22nd. On the last three days of the month, however, bright warm conditions were experienced, maximum temperatures exceeding 80° at many points.

#### ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for April exceeded the normal throughout Canada, except from Eastern Alberta to the Rainy River District of Ontario, where the average was not reached.

From Lake Huron to the Maritime Provinces, positive differences were large, being generally more than 0.1 of an inch. The range of departure from average was 0.19 of an inch, the extremes being -0.05 of an inch at Minnedosa, Man., and 0.14 of an inch at Kingston, Ont. and St. John, N.B.

#### HIGH AREAS.

Six areas of high pressure were charted, one first appeared in the Yukon Territory, one in Northern Manitoba, three on the United States Pacific Coast and one in the Missouri Valley. The area from the Yukon was very important, assuming practically the winter type of system. It travelled over Canada far to the northward, ultimately drawing southward into the Lower St. Lawrence Valley and the Maritime Provinces, thence across Newfoundland. The remaining five systems were of the usual early spring type of areas, their paths being over the Great Lakes, thence southeastwards and off the Atlantic Coast.

#### LOW AREAS.

Thirteen areas of low pressure were charted. Two first appeared on the Alaskan coast; two in the interior of British Columbia; two in the West Pacific States; three in the South Pacific States; two in the far Southwest States and two off the Atlantic Coast. The Atlantic depressions each caused gales in Newfoundland, but the continental areas were for the most part feeble rather than energetic, being only occasionally accompanied by much unsettled weather.

#### WINDS, APRIL, 1911.

PROVINCE AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of Gales.	Number of Strong Winds.	Number of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Victoria .....	6895	499	30	2	10	7	W.
Triangle Island .....	9293	823	75	5	6	8	N.W.
ALBERTA.							
Edmonton .....	5898	391	23	0	1	12	N.W.
Sulphur Mt. Band .....	11708	716	39	6	10	6	S.W.
SASKATCHEWAN.							
Qu'Appelle .....	5961	399	22	0	2	9	S.W.
MANITOBA.							
Winnipeg .....	9 60	820	19	1	7	10	N. & N.W.
ONTARIO.							
Parry Sound .....	5580	426	23	1	1	11	S.W.
Port Arthur .....	7272	525	37	2	3	12	E. & N.
Woodstock .....	7115	439	33	1	1	15	N.W.
Toronto .....	9112	616	36	3	1	11	N. & N.W.
QUEBEC.							
Montreal .....	9822	599	36	1	12	14	S. to W.
Quebec .....	9311	618	36	3	11	8	N.E.
Father Point .....	11592	851	46	10	9	3	W.
MARITIME PROVINCES.							
Pt. Escuminac .....	11559	799	43	6	10	11	S.E.
Pt. Lepreau .....	9612	603	15	3	15	7	N.W.
St. John .....	8118	505	29	0	15	7	N.W.
Halifax .....	9541	622	40	2	11	9	N.E.
Flat Pt. .....	10007	727	35	5	14	5	N.

\*For 23 days only.

## TEMPERATURE.

On Vancouver Island, the coast and the lower mainland of British Columbia the mean temperature of the month was below normal by from  $2^{\circ}$  to  $4^{\circ}$ , while in the Cariboo district the deficiency amounted to  $6^{\circ}$ . In Alberta the mean temperature was also less than average by  $2^{\circ}$  in the northern portion and by  $3^{\circ}$  to  $4^{\circ}$  in the southern. In northern and eastern Saskatchewan the normal was exceeded by  $1^{\circ}$  in the north and by  $2^{\circ}$  in the eastern-central districts. In southwestern Saskatchewan, however, there was a deficiency of  $2^{\circ}$  to  $3^{\circ}$ . The weather of the month was warmer than usual in Manitoba by from  $1^{\circ}$  in the west to  $3^{\circ}$  in the most easterly districts.

Differences from normal varied greatly in Ontario. In the Lake Superior districts and generally in southwestern counties the mean was either normal or a little less. In those counties lying between the Georgian Bay and the Upper St. Lawrence there was a small excess over average temperature. In the Ottawa Valley, however, the month was very cool, with a mean  $4^{\circ}$  below normal.

In Upper Quebec there was a deficiency of about  $1^{\circ}$ , but in Lower Quebec normal conditions obtained.

In the Maritime Provinces the mean temperature was generally  $2^{\circ}$  below normal.

*The highest and lowest temperatures recorded in each Province during the month of April, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia,	$83^{\circ}$ at Enderby on the 29th.	$-21^{\circ}$ at Fort St. James on the 4th.
Alberta,	$80^{\circ}$ at Medicine Hat on the 21st,	$-25^{\circ}$ at Eekville on the 4th.
Saskatchewan,	$85^{\circ}$ at Muenster on the 26th.	$-12^{\circ}$ at File Hills on the 6th.
Manitoba,	$85^{\circ}$ at Morden on the 28th,	$-15^{\circ}$ at Berens River on the 1st.
Ontario,	$85^{\circ}$ at Midland on the 28th,	$-16^{\circ}$ at White River on the 1st.
Quebec,	$82^{\circ}$ at Chicoutimi on the 27th,	$-26^{\circ}$ at Lake Edward on the 2nd. and at Shawinigan Falls on the 30th.
New Brunswick,	$82^{\circ}$ at St. Stephen on the 20th	$7^{\circ}$ at Chatham on the 3rd.
Nova Scotia,	$79^{\circ}$ at Halifax on the 29th,	$7^{\circ}$ at Truro on the 12th.
P. E. Island,	$75^{\circ}$ at Charlottetown on the 28th,	$9^{\circ}$ at Charlottetown on the 3rd.

## PRECIPITATION.

More than normal precipitation occurred in the Cariboo district of British Columbia, southwestern and central Saskatchewan, eastern Manitoba, and southwestern Ontario. Elsewhere in the Dominion there was a deficiency.

## BRIGHT SUNSHINE.

The amount of bright sunshine registered during the month of April was in excess of average in British Columbia, Alberta, eastern Saskatchewan, Manitoba, the Ottawa Valley, Quebec and the Maritime Provinces; but was deficient in northwestern Saskatchewan, and over the greater part of Ontario. In the western provinces the excess was very pronounced.



PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, APRIL, 1911.

a Barometer not reduced to Sea Level.

[illegible]

NUTRITION —		Carcasses		Hides		Wool		Bones		Antlers		Hooves		Tails		Skulls		Other		Total	
Year	Month	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value
1900	Jan	60	11	134	31	2171	61	4	139	20	1240	30	60	31	60	20	32	1	177	23	7
1900	Feb	61	4	139	20	1240	30	60	31	60	20	32	1	177	23	7	23	8	9	3	18
1900	Mar	60	45	135	0	2075	60	45	135	0	2075	60	45	135	0	2075	60	45	135	0	2075
ATHERTON																					
1900	Jan	51	43	113	17	1650	52	24	113	10	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Feb	52	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Mar	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Apr	54	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	May	55	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jun	56	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jul	57	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Aug	58	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Sep	59	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Oct	60	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Nov	61	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Dec	62	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
ATHERTON																					
1900	Jan	55	56	118	35	1305	56	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Feb	56	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Mar	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Apr	58	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	May	59	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Jun	60	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Jul	61	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Aug	62	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Sep	63	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Oct	64	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Nov	65	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
1900	Dec	66	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240	57	52	112	17	1240
ATHERTON																					
1900	Jan	51	43	113	17	1650	52	24	113	10	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Feb	52	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Mar	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Apr	54	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	May	55	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jun	56	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jul	57	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Aug	58	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Sep	59	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Oct	60	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Nov	61	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Dec	62	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
ATHERTON																					
1900	Jan	51	43	113	17	1650	52	24	113	10	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Feb	52	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Mar	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Apr	54	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	May	55	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jun	56	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jul	57	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Aug	58	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Sep	59	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Oct	60	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Nov	61	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Dec	62	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
ATHERTON																					
1900	Jan	51	43	113	17	1650	52	24	113	10	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Feb	52	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Mar	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Apr	54	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	May	55	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jun	56	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jul	57	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Aug	58	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Sep	59	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Oct	60	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Nov	61	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Dec	62	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
ATHERTON																					
1900	Jan	51	43	113	17	1650	52	24	113	10	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Feb	52	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Mar	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Apr	54	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	May	55	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jun	56	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Jul	57	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512	53	10	115	31	4512
1900	Aug	58	10	115	31	4512	53	10	115	31	4512										



PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, APRIL, 1911.

\* Stations not furnished with Registering Thermometers.

[illegible]









PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c.,  
DURING APRIL, 1911.

STATIONS.	RAINFALL.					SNOWFALL.				REMARKS.
	Amount in inches	No. of Days '01 or over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA—										
Alkali Lake.....										Thunder on 9, 10.
Annis.....	0.85	4	26	0.35	18					
Beaver Lake.....	0.81	5	25	0.55	17					
Coquitlam.....	1.78	5	25	1.00	18					
Denman's Island.....	1.61	4	26	0.80	9					
Ferguson.....	1.62	5	23	0.44	13	6.5	2	3.5	10	
Goldstream Lake.....	1.86	11	16	0.57	18					
Grand Forks.....										
Hydraulic.....	0.13	1	27	0.13	24	9.0	2	6.0	2	
Hornby Island.....	2.17	5	25	1.31	9					
Jordao River.....	3.10	11	18	0.80	10 18	1.0	1	1.0	11	
Jordan River (Bear Creek).....	2.15	5	21	0.81	10	15.5	4	10.0	10	
Little Qualicum (French Creek, V.I.).....	0.86	3	27	0.43	18					
Monte Creek.....	0.35	2	28	0.23	18					
Naas Harbour.....	4.47	8	21	1.25	18	2.0	1	2.0	7	
Skidegate.....	3.83	12	17	0.97	20	3.5	1	5.5	10	
ALBERTA—										
Bardo.....						2.0	1	2.0	3	
Bismark.....						12.1	5	3.7	1	
Bruderheim.....	0.18	1	25	0.18	25	3.5	4	2.0	2	
Blitern Lake.....	0.06	1	27	0.06	25	5.3	2	3.5	3	
Bantry.....										
Brooks.....	0.05	1	25	0.05	23	13.3	4	7.0	1	
Conjuring Creek.....						3.5	2	2.5	3	
Coutts.....										
Campsie.....	0.25	2	26	0.20	6	2.1	2	1.3	3	
Caldwell.....						13.8	9	1.0	1	
Dorence.....										
Elkwater.....						6.0	3	1.0	29	
Grassy Lake.....						*	7			
Jumping Pound.....	0.10	2	28	0.09	3					
Lacombe.....	0.40	2	27	0.27	25	4.5	1	4.5	3	
Langdon.....										
Loch Sloy.....						11.0	6	4.0	2	
Lyndon.....						16.3	3	11.6	3	
Lyndon (Phayle Creek).....	0.15	1	29	0.15	28	*	1	*	28	
Lineham.....						0.5	1	0.5	3	
Macleod.....						16.5	6	5.0	3	
Minda (Many Berries Ranch).....						6.0	5	4.8	27	
Maycroft.....	0.15	1	27	0.15	28	11.0	2	6.0	3	
Mayton.....										
Okotoks.....						4.0	1	4.0	2	
Ponoka.....	0.25	2	26	0.15	19	5.8	2	4.0	1	
Pekisko.....						10.0	2	6.0	12	
Sion.....	0.11	1	22	0.11	25	7.5	7	3.0	11	
Seven Persons.....						18.7	4	12.1	28	
Tilley.....										
Wabamun.....										
SASKATCHEWAN—										
Carmichael.....										
Coule.....										
Elm How.....										
Forks Swift Current (Gull Lake).....	0.13	3	19	0.08	28	5.8	8	2.0	1	
Gull Lake.....						7.7	1	2.5	28	
Hanley.....										
Kindersley.....						12.0	4	8.0	11	
Kelvinhurst.....						4.0	2	2.0	1.2	
Last Mountain.....										
Maple Creek.....	0.12	1	20	0.12	29	10.6	9	3.0	2.30	
Willow Creek.....	1.02	1	28	1.02	29	3.0	1	3.0	2	
MANITOBA—										
Cartwright.....										
Deloraine.....	0.01	1	24	0.01	27	4.8	5	2.0	4	
Gretna.....	1.05	2	25	0.60	13	11.0	3	6.0	13	
Norquay.....	0.53	2	23	0.35	11	14.0	5	6.0	13	
Rapid City.....	0.39	2	26	0.20	10	4.6	2	2.6	5	
Rosebank.....	0.90	2	28	0.60	12	*	1	*	13	
ONTARIO—										
Arden.....										
Deer Park.....	1.18	6	24	0.51	5	3.8	2	2.0	2	
Dutton.....										
Emsdale.....	1.56	7	23	0.55	14					
Goderich.....										
Georgetown.....	1.48	8	20	0.53	5	0.8	2	0.5	16	
Grantham.....	1.41	8	22	0.55	5					
Grand Valley.....	1.06	6	22	0.42	5	2.3	2	1.3	3	
MacCue.....	0.40	1	28	0.40	14	4.0	1	4.0	5	
Orangeville.....	2.34	7	22	0.78	5	0.7	1	0.7	1	
Princeton.....	2.30	5	25	1.06	5					
Sydenham.....	1.42	2	27	0.80	15	1.0	1	1.0	4	
Strathroy.....	3.76	7	23	0.92	13					
Watford.....	2.55	9	21	0.77	20					
Westport.....	0.50	1	26	0.50	5	1.8	3	2.5	4	
Wooler.....	1.10	3	27	0.80	5					
Westminster.....	2.80	3	27	1.22	13					
Warton.....	1.39	4	24	0.51	4 13	5.0	2	1.0	6	
Wesley.....	1.44	6	21	0.58	5	3.5	3	2.5	2	
QUEBEC—										
Timiskaming.....	1.45	3	25	0.76	5	0.3	2	0.2	6	
Kipawa.....										
Quinze Dam.....	2.56	3	24	2.05	14	4.8	3	3.0	15	
NEW BRUNSWICK—										
Point Escuminac.....	0.25	3	26	0.12	19	4.0	1	4.0	5	
								</		



MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
APRIL, 1961.

STATIONS.	HOURS ENDING														
	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 a. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.
Victoria .....	62	43	60	65	75	81	81	80	77	77	72	69	39	T	
Nanaimo .....	69	40	62	65	69	66	66	60	63	69	68	63	52	19	
Vancouver .....	16	49	62	62	73	73	77	68	71	68	63	63	57	21	
Agassiz .....	T.	31	52	61	63	70	67	75	71	69	72	59	27		
Tranquille .....	11	49	71	68	78	76	71	71	69	72	66	63	49	20	
Summerland .....	29	75	67	69	90	68	88	75	69	76	72	69	47	94	
Kamloops .....	11	49	62	70	74	79	76	71	71	62	60	66	33	65	
Edmonton .....	17	35	51	65	67	67	71	61	63	64	58	56	47	21	
Lethbridge .....	01	28	45	58	61	62	65	70	66	67	63	56	41	40	97
Lacombe .....	12	26	42	56	69	79	71	69	66	67	65	62	41	27	91
Medicine Hat .....	13	46	54	66	75	78	76	83	85	76	68	59	46	67	
Dunvegan .....															
Fort Vermilion .....		10	26	39	65	65	70	71	74	65	56	31	10		
Battleford .....		T.	14	39	57	63	68	61	61	61	59	48	15	T.	
Indian Head .....	07	40	61	73	80	77	72	72	71	69	66	51	14	96	
Moosejaw .....															
Rosthern .....	06	36	61	62	72	75	69	71	75	67	62	62	41	11	91
Brandon .....	02	28	56	77	81	83	80	78	71	72	68	63	35	68	
Winnipeg .....	13	48	63	72	78	76	72	75	73	81	71	70	55	14	
Haileybury .....	11	55	70	73	67	66	69	69	62	58	51	49	49	24	
Woodstock .....	02	18	33	45	49	48	53	54	51	48	44	42	31	01	
Lindsay .....	01	11	31	51	61	61	63	61	56	53	49	43	34	19	
Barrie .....		27	48	60	56	62	62	59	58	56	51	53	38	T	
Toronto .....		17	52	65	61	61	65	65	61	57	56	52	44	08	
Kingston .....	01	22	44	61	64	59	56	58	56	51	45	37	12	T.	
Ottawa .....	19	62	72	79	73	78	77	71	72	68	63	61	53	08	
Montreal .....	03	46	61	71	70	72	73	68	71	62	59	27	03		
Quebec .....		30	58	70	73	74	77	76	75	75	71	69	39	62	
Sherbrooke .....	20	53	61	67	68	66	67	69	65	66	61	59	48	14	
Fredericton .....	00	18	63	65	68	68	72	74	71	64	71	61	47	14	
Charlottetown .....	04	25	46	54	55	54	51	56	56	52	58	56	39	05	

	Victoria.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Dunvegan.	Ft. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Rosthern.	Brandon.	Winnipeg.	Haileybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.	
Registered duration in hours.	246	228	248	216	217	288	233	223	226	228	219		176	165	257		232	210	26	232	156	177	189	200	171	248	266	231	296	210	18	..
Percentage of possible duration .....	69	56	60	53	60	79	56	53	53	55	60		41	39	57		56	58	63	57	39	41	47	56	41	61	58	58	58	50	41	..
Difference from average ..	+15	+9		+21									12	+19					15	+11		9	3	+2	5	+19	+8	+19	+11		..	
Maximum percentage in one day .....	89	90	93	81	98	90	90	91	91	99	91		75	73	91		91	91	91	96	88	80	88	89	87	96	91	85	96	96	92	..
Date of maximum .....	4	25	25	20	28	26	20	28	11	28	15		22	10	18		11	6	21	11	24	9	3	21	7	21	3	29	26	23	12	..
No. of days completely clouded.....	0	5	0	1	2	1	1	3	3	3	1		3	1	3		2	2	3	3	8	1	3	1	4	1	2	2	2	5	6	..

*Aurora recorded:—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Aitkensville, III; Treherne, III; Schreiber, IV; Lake Talon, IV; Lucknow, IV; Kenora, III; Chicoutimi, Haileybury, III; Aweme, III; Barrie, IV.
2. Emsdale, III; Bruce Mines, IV; Schreiber, IV; Kakabeka Falls, II; Haileybury, III; Gravenhurst, I.
3. Grand Manan, IV.
6. Fort Vermilion, III.
7. Sion, Boutin, II.
8. Rapid City, II; Cartwright, I; Yarbo, III; Glenbryan, Chaplin, IV; Brownlee, III; Boutin, II; Peace River Landing, Aitkensville, II; Treherne, III; Agincourt, II; Kakabeka Falls, III; Charlottetown, IV; Father Point, III; Aweme, II.
9. Sion, Muenster, I; Melfort, III; Waitefield, II; Agincourt, III; Lake Talon, Kakabeka Falls, I; Kenora, III; Brantford, IV; Parry Sound, II; Quebec, III; Stonecliff, II; Haileybury, II.
10. Sion, Kenora, II.
12. Sion.
14. Spirit River; Oliver.
15. Waseca, Melfort, II; Glenbryan, I; Foxleigh, Chaplin, IV; Crescent Lake, III; Grenfell, III; Boutin, IV; Chilcote, III; Halkirk, Westaskiwin, Waitefield, II; Aweme, II; Treherne, II; Bruce Mines, IV; Renfrew, Montague, Madoc, II; Abitibi, St. John, III; Quebec, IV; Father Point, III; Haileybury, IV; Gravenhurst, II; Lindsay, IV; Fort Vermilion, I; Spirit River; Oliver.
16. Rapid City, II; Cartwright, Georgetown, III; Yarbo, II; Muenster, IV; Melfort, III; Glenbryan, I; Foxleigh, Estevan, III; Chaplin, IV; Crescent Lake, III; Grenfell, III; Boutin, II; Halkirk, Pakan, III; Threehills Creek, IV; Waitefield, IV; Aitkensville, IV; Aweme, III; Treherne, IV; Agincourt, IV; Bruce Mines, IV; Schreiber, III; Midland, Kakabeka Falls, IV; Montague, Madoc, IV; Cape Magdalen, Parry Sound, IV; Quebec, IV; Father Point, III; Stonecliff, II; Minnedosa, IV; Gravenhurst, II; Lindsay, IV; Stuart's Lake, Spirit River; Barrie IV; Oliver.
17. Sion, IV; Rapid City, I; Emsdale, III; Georgetown, IV; Yarbo, II; Muenster, II; Melfort, IV; Glenbryan, I; Foxleigh, Crescent Lake, IV; Brownlee, Pakan, IV; Waitefield, I; Aitkensville, IV; Agincourt, IV; Lake Talon, Midland, Montague, Minnedosa, III; Haileybury, III; Red Deer, I; Oliver.
18. Sion, II; Cartwright, Westport, Melfort, IV; Glenbryan, I; Foxleigh, Estevan, IV; Crescent Lake, IV; Chilcote, III; Aitkensville, III; Aweme, IV; Treherne, III; Bruce Mines, II; Schreiber, IV; Lake Talon, IV; Midland, Renfrew, Montague, Chicoutimi, Quebec, III; Stonecliff, II; Cochrane, II; Haileybury, III; Red Deer, IV; Stuart's Lake; Barrie, IV; Oliver.
19. Sion, II; Campsie, III; Rapid City, I; Glenbryan, I; Foxleigh, Chaplin, IV; Brownlee, Chilcote, IV; Halkirk, Threehills Creek, III; Wetaskiwin, Waitefield, III; Aitkensville, IV; Agincourt, IV; Schreiber, IV; Lake Talon, IV; Montague, Quebec, III; Ottawa, III; Minnedosa, III; Haileybury, II; Red Deer, IV; Barrie, IV; Oliver.
20. Bruederheim, Sion, II; Campsie, III; Cartwright, III; Glenbryan, I; Foxleigh, Chaplin, I; Brownlee, Bella Coola, IV; Chilcote, III; Halkirk, Hillsdown, IV; Peace River Landing, Threehills Creek, III; Wetaskiwin, Waitefield, II; Aitkensville, IV; Aweme, II; Agincourt, IV; Cochrane, III; Gravenhurst, IV; Red Deer, IV; Barrie, IV; Oliver.
21. Sion, III; Cartwright, Melfort, IV; Hillsdown, III; Peace River Landing, Wetaskiwin Waitefield, IV; Aitkensville, IV; Agincourt, IV; Schreiber, IV; Lake Talon, IV; Kakabeka Falls III; Red Deer, II; Oliver.
22. Sion, II; Campsie, IV; Cartwright, IV; Yarbo, III; Melfort, III; Chaplin, I; Crescent Lake, III; Grenfell, II; Brownlee, Hillsdown, III; Peace River Landing, Wetaskiwin, Waitefield, IV; Brandon, Aitkensville, III; Aweme, III; Schreiber, IV; Kakabeka Falls, IV; Minnedosa, III; Haileybury, III; Gravenhurst, IV; Red Deer, IV; Oliver.
23. Yarbo, IV; Waseca, Crescent Lake, IV; Waitefield, IV; Lucknow, IV; Minnedosa, II; Truro, IV; Red Deer, I; Oliver.
24. Muenster, IV; Crescent Lake, IV; Aitkensville, IV; Montague, Fort Vermilion, I; Oliver.
25. Sion, II; Crescent Lake, IV; Waitefield, III; Red Deer, I.
26. Sion, IV; Waseca, Crescent Lake, IV; Threehills Creek, IV; Red Deer, I.
27. Sion, II; Yarbo, IV; Threehills Creek, IV; Father Point, III; Red Deer, I.
28. Sion, II; Father Point, III; Red Deer, I.
29. Boutin, I; Threehills Creek, I; Red Deer, I.
30. Sion, Waitefield, III; Red Deer, IV.

*Thunder recorded :*

4. Haliburton.
5. Madoc.
6. Wesley, Hamilton, Brantford.
7. Charlottetown.
9. Annis.
10. Annis, Quesnel; Lloydminster.
11. Campsie, Cartwright, Rosebank, Yarbo Rathmullen, Chaplin, Crescent Lake, Ninga, Aweme, Carberry, Almasippi, Treherne, Minnedosa, Deloraine.
13. Schreiber.
15. Ottawa.
24. Glacier.
25. Rathmullen.
27. Cartwright, Yarbo, Foxleigh, Cunnington Manor, Crescent Lake, Kenora, Berens River.
28. Berens River.

## FORECASTS FOR APRIL, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1118. These were divided as follows :

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta.....	71	56	18	0	87.8
Saskatchewan.....	71	67	6	1	91.6
Manitoba.....	75	60	14	1	89.3
Lake Superior.....	98	78	14	6	86.7
Lower Lake Region.....	103	77	23	3	85.9
Georgian Bay.....	105	82	20	3	87.6
Ottawa Valley.....	81	69	9	3	90.7
Upper St. Lawrence.....	81	68	12	1	91.3
Lower St. Lawrence.....	93	78	12	3	90.3
Gulf.....	108	90	15	3	90.3
Maritime Provinces West.....	113	91	12	7	88.5
Maritime Provinces East.....	113	94	13	6	88.9
Total.....	1118	913	168	37	89.2

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto,  
May, 1911.



# DEPARTMENT OF MARINE AND FISHERIES, CANADA.

## METEOROLOGICAL SERVICE.

# Monthly Weather Review.

VOL. XXXV.

MAY, 1911.

No. 5.

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### GENERAL SYNOPSIS.

In British Columbia wet, cool weather retarded the growth of vegetation during the month of May. Over the southern portion of the province rain occurred very frequently during the first two weeks; in some districts, indeed, daily. Like conditions persisted throughout the third week in many sections of the Kootenays, but the last week, however, was fine and much warmer throughout the province. In the Cariboo district precipitation occurred on fewer days than elsewhere, but temperatures were just as unseasonably low.

The month began with bright, warm weather in Alberta, while from the 3rd to the 7th temperatures were very high, maxima of 85° and higher occurring in the greater part of the province, and 90° or higher in the southwest. Medicine Hat reporting 99° on the 5th. From this date until the last two days of the month much cooler weather intervened, sharp night-frost occurring on the 7th, from the 9th to the 11th and on the 24th and 28th. Showers occurred about the 9th or 10th, 15th to 17th, 20th and 25th. Light falls of snow occurred in several districts on one to three days during the last week.

In Saskatchewan conditions were much the same as in Alberta, except that the period of heat which reached its climax on the 5th, was more pronounced, temperatures of 90° and higher occurring over a very large portion of the province.

During the month of May the province of Manitoba experienced four periods of warm weather. The dates of these were the 5th and 6th, the 8th and 9th, the 17th and 18th, the 30th and 31st. The highest temperatures of the month were registered on the 17th, exceeding 85° in all districts and 90° in many. On the nights of the 2nd and 3rd, the 12th and 21st sharp frosts were of general occurrence. The first nine days were fine but showers occurred on from 8 to 12 days during the remainder of the month. Snow fell to a considerable depth on or about the 11th at Aweme, Morden and Treherne, but in other districts of the province no snow in measurable quantities was recorded.

The mean temperature of the month of May of this year was in Ontario, higher than that of any other May, previously on record. That of May, 1896, approached nearest. The first three days of the month promised nothing of the extreme heat to come. Flurries of snow occurred in many districts and heavy night frosts were of general occurrence till the 7th, ice forming in exposed places to a thickness of one-eighth to one-quarter of an inch. On the 7th began a period of heat which lasted continuously except for a cold interval on the 12th or 13th until the 24th. Moderate temperatures ensued till the 26th, which together with the two following days was very warm. Maximal temperatures during these periods ranged between 80° and 99°. The rainfall of the month was very scanty in southern and eastern Ontario. In the Georgian Bay counties and in Algoma and many parts of the Thunder Bay and Rainy River districts an excess over normal was reported by several observers.

In western and central Quebec weather conditions were very like those which obtained in Ontario. From the 7th to the end of the month there were very few cool days. From the 20th to the 24th the heat was at its maximum, many stations recording 90° or higher on four successive days. The rain-

fall was much less than the normal quantity, although in some districts it was recorded on from 9 to 11 days. In Eastern Quebec, especially the Gaspé counties, although the mean temperature of the month was higher than normal, the heat was not so great and rain fell in greater quantities, the total precipitation of the month exceeding the average for May.

The month was very hot and dry throughout the Maritime Provinces. From the 19th to the 22nd and on the 27th and 28th, temperatures exceeding 90° were recorded. Sharp frosts occurred on the first three nights and on the 6th, 8th and 11th. In many counties rain was recorded on one or two days only.

#### ATMOSPHERIC PRESSURE.

The mean atmospheric pressure exceeded the average over Northern British Columbia, the greater part of Ontario, Quebec and the Maritime Provinces, while subnormal values were recorded over Southern British Columbia, the Prairie Provinces, the Lake Superior district and the Gulf of St. Lawrence.

The greatest departures from normal were +0.08 of an inch at St. John, N.B., and -0.09 of an inch at Melville Hat.

#### HIGH AREAS.

Six areas of high pressure were charted and there were several minor local areas not considered. Of the six areas three first appeared on the United States Pacific Coast, two on the Northern British Columbia Coast and one to the northward of Manitoba. All of the systems eventually traversed the continent and passed off the Atlantic Coasts. The United States Pacific areas showed a marked tendency to push northward, especially the one appearing off the North Pacific States on the 18th, a portion of which spread north into Alaska and the Yukon Territory when it recurved southeastward, eventually following in the wake of the primary part of the system which had previously travelled over Canada to the Gulf of St. Lawrence and Newfoundland.

#### LOW AREAS.

Nine areas of depression were sufficiently defined to allow of their paths being traced while there were a few others of feeble energy and of short and erratic courses which were not charted. Of the nine areas, two first appeared in the vicinity of Northern British Columbia, four in the West Pacific States, one in the Western States and two in Eastern Canada. The area which passed into the Gulf of St. Lawrence from Labrador on the 15th and thence over Newfoundland and the area which formed in Southern Dakota on the 30th and with greatly increased energy afterwards, traversed the Great Lakes and the St. Lawrence Valley were two of the most important depressions of the month, although several of the remaining areas were quite pronounced in our Western Provinces.

#### WINDS, MAY, 1911.

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of Gales.	Number of Strong Winds.	Number of Fresh Winds.	GENERAL DIRECTION.
<b>BRITISH COLUMBIA.</b>							
Victoria.....	6438	362	39	1	9	13	S.W.
Point Garry.....	6321	533	38	4	11	7	N.W.
Triangle Island.....	8111	959	51	7			
<b>ALBERTA.</b>							
Sulphur Mt., Banff.....	11703	866	16	8	8	6	S.W.
Edmonton.....	5557	3.8	24		1	10	W.
<b>SASKATCHEWAN.</b>							
Swift Current.....	8935	570	41	3	10	10	S.W.
Prince Albert.....	5244	385	28		2	12	E. & S.
The Pas.....	6368	457	40	2	2	11	E.
<b>MANITOBA.</b>							
Winnipeg.....	9353	159	31	2	11	8	W. & N.
<b>ONTARIO.</b>							
Port Arthur.....	7717	541	31	1	8	15	E. N.E.
Parry Sound.....	5105	385	23		2	7	S.W.
Pelée Island.....	6896	382	25		1	14	S.W.
Toronto.....	6858	186	37	1	5	7	S.W.
Queioph.....	7711	172	34				N.W.
<b>QUEBEC.</b>							
Quebec.....	9890	598	42	6	11	8	N.E. & S.W.
Father Point.....	11850	626	15	11	7	5	W.
Anticosti.....	9329	561	37	2	13	11	S.E.
<b>MARITIME PROVINCES.</b>							
Fredericton.....	6979	496	27		7	10	S.W.
St. John.....	7728	173					S.
Pt. Lepreaux.....	8790	713	11	5	12	7	S.W.
Halifax.....	8981	637	10	4	9	8	W.
Flat Pt.....	10735	627	12	1	8	9	S.W.
Sable Island.....	13286	711					S.W.

### TEMPERATURE.

From the Pacific coast to eastern Saskatchewan the weather of the month of May was cooler than is normal to that portion of the Dominion, while from Manitoba eastward to the Atlantic Ocean the heat was many degrees abnormal. In Ontario no such heat has been experienced during the month of May in any year of record. And this is also true of a great portion of the Maritime Provinces.

In British Columbia mean temperatures were from 1° to 3° lower than normal, in Alberta 1° to 2° in the eastern portion and about normal in the western. In Saskatchewan there was a deficiency of about 3° in the western districts but near the Manitoba boundary temperatures were nearly normal.

In Manitoba mean temperatures exceeded the normal mean temperatures of May by  $1^{\circ}$  in the extreme western portion and by  $4^{\circ}$  to  $1^{\circ}$  in the eastern. The excess over normal increased through the Lake Superior region to from  $7^{\circ}$  to  $9^{\circ}$  in southern Ontario and the Ottawa Valley. In western and central Quebec there was an excess of  $5^{\circ}$  to  $8^{\circ}$  but in the Gulf counties of only  $3^{\circ}$  or less, while in the Maritime Provinces it ranged between  $2^{\circ}$  and  $6^{\circ}$ .

*The highest and lowest temperatures recorded in each Province during the month of May, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia, .....	{ 90° at Alberni on the 31st..... } and Enderby on the 31st..... }	18° at Chilcotin on the 9th.
Alberta, .....	99° at Medicine Hat on the 5th.....	16° at Blairmore on the 23rd
Saskatchewan,.....	{ 91° at Battleford on the 5th..... } and Chaplin on the 5th..... }	10° at Grenfell on the 1st.
Manitoba,.....	94° at Moose Horn Bay on the 18th,.	10° at Pierson on the 1st.
Ontario,.....	{ 99° at Collingwood on the 27th... } and Pelee Island on the 19th }	7° at Matheson on the 4th.
Quebec,.....	95° at Chicoutimi on the 21st.....	16° at Abitibi on the 4th.
New Brunswick, .....	96° at Grand Manan on the 17th..	20° at St. Stephen on the 5th.
Nova Scotia,.....	89° at Halifax on the 22nd.....	12° at Antigonish on the 16th.
P. E. Island, .....	83° at Charlottetown on the 22nd....	28° at Charlottetown on the 17th.

### PRECIPITATION.

The precipitation of the month was generally well in excess of average in British Columbia although deficiencies were reported from some northerly districts. And the same is true of Alberta and Saskatchewan also. In Manitoba the precipitation was very heavy, in some cases exceeding the normal by as much as four inches. An excess was also reported from the Lake Superior districts and the Georgian Bay counties, but in the remainder of Ontario, in the Maritime Provinces, and all Quebec except the Gaspé and North Shore counties, there was a marked deficiency.





[illegible]













PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c.,  
DURING MAY, 1911.

STATIONS.	TEMPERATURE.					Date.	PRECIPITATION.				REMARKS.	
	Amount in inches	No. of Days 101 or over	No. of Fair Days	Heaviest Fall in Month	Amount in inches		No. of Days.	Heaviest Fall in Month	Date.			
BRITISH COLUMBIA—												
Alkali Lake.....	1.70	1	30	1.00	12						Thunder on 5.	
Annis.....	1.17	13	18	0.21	16							
Beaver Lake.....	2.25	8	23	0.45	4							
Coquitlam.....	5.65	10	21	1.60	8							
Denman's Island.....	4.76	10	21	2.20	4							
Ferguson.....	2.09	11	17	0.42	16							
Goldstream Lake.....	2.40	15	16	0.59	12							
Hydraulic.....	1.19	8	23	0.70	5							
Hornby Island.....	3.68	10	21	1.02	5							
Jordan River.....	4.17	14	17	1.00	4							
Jordan River (Bear Creek).....	5.26	12	19	1.30	5							
LittleQualicum (French Creek, V.I.).....	2.75	9	22	0.96	5							
Monte Creek.....	0.15	5	26	0.06	3							
Naas Harbour.....	2.71	9	22	0.80	10							
Skidegate.....	1.21	7	24	0.62	11							
Shawnigan Lake.....	2.38	11	17	0.47	4							
ALBERTA—												
Bardo.....	1.42	4	26	0.46	18	0.3	1	0.3	10	Thunder on 5.		
Bismark.....	0.58	3	28	0.26	16	*	1	*	21			
Bruderheim.....	1.81	9	21	0.86	17	*	1	*	25			
Bittern Lake.....	1.35	11	20	0.44	18							
Bantry.....												
Brooks.....	2.27	8	22	0.93	23	*	1	*	23			
Conjuring Creek.....												
Coutts.....												
Campsie.....	1.47	8	23	0.44								
Caldwell.....	4.14	10	19	1.29	16	8.5	2	5.0	22			
Dorenele.....	0.99	5	26	0.42	24					Thunder on 29.		
Hunstable.....	1.89	11	20	0.80	18							
Elkwater.....												
Grassy Lake.....	2.59	2	29	1.60	19							
Jumping Pound.....	2.72	4	26	1.90	11	10.0	1	10.0	22			
Lacombe.....	1.43	4	27	1.05	17							
Langdon.....												
Loch Sloy.....	2.26	9	20	0.89	16	10.5	2	7.0	23			
Lyndon.....	0.59	3	28	0.21	13							
Lineham.....	2.00	1	29	2.00	14	1.8	1	1.8	22			
Macleod.....	3.74	14	17	0.66	13					Thunder on 19.		
Minda (Many Berries Ranch).....												
Mayeroff.....	2.63	5	25	1.17	11	8.2	1	8.2	22			
Mayton.....												
Okotoks.....	2.03	6	24	0.62	14	8.3	1	8.3	23			
Playle Creek.....	3.27	10		0.85	13	*	3	*	22-25-27			
Ponoka.....	1.24	4	27	0.82	17							
Pekisko.....	4.22	10	19	1.27	15	14.0	2	8.0	23			
Sion.....	2.19	14	17	0.61	17							
Seven Persons.....	1.64	6	25	0.40	13							
Tilley.....										Aurora on 1, 12, 7, 21, 24, 26, 27, 28, 29, 30.		
SASKATCHEWAN—												
Carmichael.....	0.04	1	29	0.04	28	3.5	1	3.5	1	Thunder on 14, 28.		
Coule.....												
Elm How.....												
Forks Swift Current (Gull Lake).....	1.64	11	20	0.39	11							
Gull Lake.....	0.76	5	26	0.23	23							
Hanley.....												
Kindersley.....	8.00	7	21	3.56	23							
Kelvinhurst.....	1.47	7	24	0.40	16							
Last Mountain.....												
Maple Creek.....	1.20	11	20	0.31	23							
Willow Creek.....	0.32	5	26	0.09	13					Thunder on 16.		
MANITOBA—												
Cartwright.....	3.12	11	20	1.05	11							
Deloraine.....	5.97	10	21	3.00	11							
Gretna.....	5.46	7	23	1.78	11	4.0	1	4.0	11			
Norquay.....	2.31	9	21	1.65	25	14.0	1	11.0	11			
Rapid City.....	3.23	8	23	1.35	27	*		*				
Rosebank.....	4.63	8	22	1.75	11		1		11			
ONTARIO—												
Arden.....											Thunder on 1, 18, 23, 31.	
Deer Park.....	2.03	8	22	0.83	1	0.3	1	0.3	1			
Dutton.....	0.40	2	29	0.30	1							
Emsdale.....	2.43	11	20	0.66	2							
Goderich.....												
Georgetown.....	1.87	8	22	0.76	1	0.1	1	0.1	3			
Grantham.....	1.37	7	23	0.51	23	*	1	*	3			
Grand Valley.....	2.50	10	20	0.61	17	1.0	4	1.0	2			
MacCue.....	1.29	7	24	0.39	1							
Orangeville.....	1.64	7	23	0.54	13	0.8	1	0.8	3			
Princeton.....	2.30	5	26	1.06	5					Thunder on 1, Thunder on 1, 11, 17, 18, 20, 22, 31.		
Sydenham.....	3.00	4	27	1.15	1							
Strathroy.....	2.54	5	25	1.23	31	1.0	1	1.0	2			
Watford.....	2.23	7	24	0.78	1							
Westport.....	1.56	5	25	0.30	18	0.3	1	0.3	3			
Wooler.....	1.43	5	26	0.46	31							
Westminster.....	1.46	4	27	0.59	23							
Warton.....												
Wesley.....	2.22	10	20	0.62	17	0.5	1	0.5	3			
QUEBEC—												
Timiskaming.....										Thunder on 23.		
Quinze Dam.....												
Perkins Mills.....	4.92	9	22	3.25	23							
NEW BRUNSWICK—												
Point Esequimaee.....	0.20	3	28	0.09	22						Aurora on 14, Fog on 22, 23 25, 28.	



MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
MAY, 1911.

STATIONS.	HOURS ENDING															
	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.
Victoria		07	25	36	42	49	51	60	62	62	54	57	46	40	34	...
Nanaimo		03	24	44	49	46	50	51	53	52	47	48	37	37	30	02
Vancouver		19	34	49	75	41	51	49	43	49	46	44	47	43	23	...
Agassiz			21	26	31	35	37	42	49	47	49	39	49	27	12	...
Tranquille		24	43	49	61	64	63	64	63	56	56	55	43	37	34	10
Summerland		26	48	49	58	59	57	63	62	51	43	47	55	45	23	...
Kamloops	04	23	46	59	62	67	64	66	65	67	66	57	47	40	30	03
Edmonton	01	30	51	54	57	65	65	67	54	54	52	47	46	48	33	07
Lethbridge	02	29	38	51	69	65	58	50	54	5	50	38	37	31	25	13 01
Lacombe	11	34	54	60	6	57	54	62	57	59	52	53	41	47	37	12
Medicine Hat	04	21	49	48	62	70	63	66	64	63	62	58	57	47	34	07
Fort Vermilion		08	39	51	59	64	77	77	71	79	71	73	59	29	04	...
Battleford		03	29	35	37	43	34	35	36	41	37	31	29	22	06	...
Indian Head		22	49	44	54	59	69	62	62	69	56	52	48	43	31	08
Moosejaw	13	44	54	55	58	59	59	62	69	61	62	56	50	49	41	09
Scott	06	30	39	49	50	47	51	53	54	56	58	49	51	47	36	05
Rosthern	07	37	48	54	56	55	55	52	56	51	54	49	49	43	34	07
Brandon	01	09	39	58	62	63	69	69	69	59	54	51	50	38	08	02
Winnipeg		29	45	50	54	58	57	60	59	53	53	55	51	38	24	...
Halleybury	02	38	52	58	57	57	64	58	62	68	71	68	59	58	41	06
Woodstock	02	17	59	63	72	70	76	71	68	70	74	74	73	75	22	01
Lindsay			17	48	80	78	73	76	73	71	73	73	65	40	31	...
Barrie		20	52	69	66	68	68	66	71	71	61	62	62	56	08	...
Toronto		06	22	75	80	79	75	68	72	79	73	71	71	70	26	...
Kingston	01	26	62	71	73	76	81	84	78	80	77	74	67	54	25	04
Ottawa		26	62	73	73	74	75	76	78	76	77	73	58	52	31	...
Montreal		14	50	61	68	75	74	75	73	74	70	63	29	07	...	...
Quebec		21	36	51	61	69	65	69	72	73	71	71	64	51	13	...
Sherbrooke	03	36	57	65	73	66	61	63	69	72	74	67	62	53	23	02
Fredericton		22	46	59	61	61	71	72	73	69	66	70	65	56	39	01
Charlottetown	04	37	54	60	67	69	70	72	69	70	69	60	61	52	27	01

	Victoria.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Ft. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Scott.	Rosthern.	Brandon.	Winnipeg.	Halleybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.	Dunvegan.
Registered duration in hours.	185	182	175	141	224	213	235	226	199	231	237	234	127	224	246	207	219	209	213	252	276	247	248	268	289	280	228	245	262	257	259	..
Percentage of possible duration .....	39	38	36	30	46	44	48	46	42	47	50	46	26	47	51	42	44	44	44	54	60	54	54	59	63	60	57	53	56	55	56	..
Difference from average ..	+ 3			0									11	- 1				- 4	- 6		+17	+ 7	+9	+10	+15	+13	+ 7	+12		+11		..
Maximum percentage in one day .....	83	83	83	80	91	90	93	91	94	94	93	76	79	89	96	89	96	82	93	96	88	86	86	84	94	93	90	87	94	92	94	..
Date of maximum .....	31	30	31	31	14	1	31	7	30	6	30	2	31	1	2	5	7	17	3	5	6	30	27	4	6	4	6	5	6	6	6	..
No. of days completely clouded.....	5	9	7	9	2	2	3	2	7	4	1	3	6	8	7	5	8	3	6	3	1	3	0	1	2	1	1	1	0	2	1	..

*Aurora recorded:—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Sion, Threehills Creek, IV; Red Deer, IV; Aitkensville, IV; Peace River Crossing, IV; Muenster, IV.
2. Sion, Red Deer, IV; Aitkensville, IV; Chilcote, IV.
4. Waitefield, II.
6. Threehills Creek, II; Red Deer, I; Hillsdown, III; Matheson, III; Grenfell, II; Melfort, II; Haileybury, IV; Kenora, IV.
7. Sion, Waitefield, II; Threehills Creek, III; Red Deer, I; Hillsdown, IV; Halkirk, Aitkensville, IV; Kakabeka Falls, III; Chicoutimi, Crescent Lake, III; Brownhill, III; Toronto, IV; Aweme, IV.
13. Chilcote, II.
14. Cartwright, II; Point Escuminac, III; Waitefield, II; Red Deer, I; Pagan, Hillview, I; Aitkensville, III; Treherne, II; Aweme, I; Montague, Cap Magdalene, Sherbrooke, Crescent Lake, III; Grenfell, II; Melfort, IV; Muenster, Cannington Manor, St. John, II; Montreal, III; Winnipeg, II; Haileybury, III; Fort St. James.
15. Aitkensville, IV; Esterhazy, IV; Port Arthur, I.
16. Aitkensville, IV; Aweme, II; Agincourt, IV.
17. Threehills Creek, IV; Red Deer, I; Aitkensville, IV.
18. Southampton, IV.
20. Red Deer, IV; Kenora, IV.
21. Sion, Red Deer, IV; Aitkensville, IV.
22. Aitkensville, III.
23. Chilliwaak, IV.
24. Sion, Chilliwaak, IV.
26. Sion, Red Deer, IV.
27. Sion, Red Deer, IV; Quebec, IV; Haileybury, IV.
28. Sion, Aitkensville, IV.
29. Sion, Haileybury, III.
30. Sion, Georgetown, IV; Red Deer, IV; Aitkensville, III; Aweme, II; Agincourt, IV; Montague, Lake Talon, Crescent Lake, III; Grenfell, IV; Chaplin, IV; Stonecliffe, II; Quebec, III.
31. Threehills Creek, III; Red Deer, IV.

*Thunder recorded :*

1. Georgetown, Deer Park, Westminster, Wesley, Emsdale, Agincourt, Beatrice, Bloomfield, Ronville, Paris, Lucknow, East Toronto, Clinton, Brantford, Birnam, Uplands, Midland, Brome, Sherbrooke, Montreal, Parry Sound, Toronto, Gravenhurst, North Bruce, Barrie.
2. Chatham, N.B.
4. Charlottetown.
5. Bruederheim, Waitefield, Wetaskiwin, Threehills Creek, Alix, Annis, Salmon Arm.
6. Cannington Manor.
7. Chicoutimi.
8. Chaplin.
9. Deloraine, Rapid City, Cartwright, Halkirk, Hillview, Treherne, Carberry, Almasippi, Oakbank, Aweme, Esterhazy, Indian Head, Crescent Lake, Cannington Manor.
10. Emsdale, Almasippi, Beatrice, Copper Cliff, Ronville, Lucknow, Kakabeka Falls, Birnam, Bruce Mines, Providence Bay, Kenora.
11. Georgetown, Westminster, Wesley, Oakbank, Lakefield, Renfrew, Peterboro', Lucknow, Lake Talon, Kakabeka Falls, Birnam, Aurora, Uplands, Schreiber, Providence Bay, Matheson, Port Stanley, Parry, Sound, Winnipeg, Port Arthur, Stoney Mountain, Lindsay, London, Barrie.
12. Matheson, Brome, Chicoutimi, Grand Manan, Montreal, Kingston, Quebec.
13. Rapid City, Cartwright, Hillview, Treherne, Ninga, Almasippi, Morden, Aweme, Grand Forks, Princeton, Esterhazy, Crescent Lake, St. John, Haileybury.
14. Oakbank, Gull Lake, Glenbryan, Winnipeg, Kenora.
15. Providence Bay.
16. Balcarres, Treherne, Ninga, Carberry, Point Clark, Peterborough, Kakabeka Falls, Birnam, Pt. Dover, Kelvinkurst, Esterhazy, Indian Head, Crescent Lake, Chaplin, Cannington Manor, Saskatoon.
17. Cartwright, Greta, Georgetown, Wesley, Treherne, Almasippi, Morden, Point Clark, Collingwood, Lakefield, Renfrew, Lucknow, Lake Talon, Kakabeka Falls, Birnam, Bruce Mines, Aurora, Schreiber, Providence Bay, Crescent Lake, Port Arthur, Gravenhurst, North Bruce.
18. Cartwright, Georgetown, Westport, Wooler, Deer Park, Emsdale, Treherne, Agincourt, Otonabee, Orillia, Madoc, Peterboro', Kakabeka Falls, East Toronto, Birnam, Chilcote, Parry Sound, Toronto, Kingston, Port Arthur, Barrie.
19. Wooler, Emsdale, Almasippi, Morden, Beatrice, Copper Cliff, Otonabee, Lakefield, Montague, Orillia, Peterboro', Madoc, Lucknow, Lake Talon, Kakabeka Falls, Haliburton, Clinton, Birnam, Bruce Mines, Uplands, Schreiber, Midland, Lake Edward, Parry Sound, Ottawa, Kingston, Gravenhurst, Lindsay, London, North Bruce.

20. Georgetown, Wesley, Agincourt, Beatrice, Point Clark, Otonabee, Owen Sound, Lucknow, Haliburton, East Toronto, Clinton, Birnam, Bruce Mines, Aurora, Matheson, Midland, Chicoutimi, Lake Edward, Cape Chatte, Chicoutimi West, Father Point, Parry Sound, Gravenhurst, Lindsay, North Bruce, Barrie.

21. Threehills Creek, Beatrice, Point Clark, Otonabee, Renfrew, Lucknow, Lake Talon, Haliburton, East Toronto, Clinton, Midland, Shawinigan Falls, Lake Edward, Chicoutimi West, Moncton, St. Stephen, Chatham, N.B., Father Point, Port Stanley, Toronto, Quebec, Gravenhurst, London, Wolfville, Barrie.

22. Georgetown, Westport, Westminster, Emsdale, Waitefield, Treherne, Agincourt, Copper Cliff, Owen Sound, Montague, Orillia, Renfrew, Lucknow, East Toronto, Brantford, Bruce Mines, Aurora, Uplands, Port Dover, Midland, Sussex, St. Stephen, Windsor, N.S., Glenbryan, St. John, Montreal, Port Stanley, Toronto, Ottawa, Gravenhurst, Barrie.

23. Westport, Deer Park, Emsdale, Perkin's Mills, Agincourt, Otonabee, Lakefield, Montague, Renfrew, Peterboro', Paris, Madoc, Lucknow, Lake Talon, Haliburton, East Toronto, Clinton, Brantford, Birnam, Bruce Mines, Port Dover, Midland, Brome, Shawinigan Falls, Sherbrooke, Lake Edward, Princeton, Cranbrook, Montreal, Port Stanley, Ottawa, Kingston, Southampton, Lindsay, London, North Bruce, Barrie.

24. Rapid City, Cartwright, Greta, Westport, Hillview, Treherne, Carberry, Almasippi, Oakbank, Morden, Aweme, Madoc, Otonabee, Peterboro', Shawinigan Falls, Cannington Manor, Montreal, Ottawa, Kingston, Winnipeg, North Bruce, Kenora.

25. Otonabee, Matheson, O'Kanagan Mission.

26. Rapid City, Brandon, Hillview, Treherne, Almasippi, Oakbank, Morden, Aweme, Schreiber, Chicoutimi West, Grand Forks, Hope, Port Arthur.

27. Westport, Chicoutimi, Chicoutimi West, Grand Forks, Winnipeg.

28. Westport, Wooler, Emsdale, Lakefield, Montague, Renfrew, Peterboro', Madoc, Lake Talon, Brome, Chicoutimi, Ottawa, Shawinigan Falls, Sherbrooke, Lake Edward, Moncton, Gull Lake, Father Point, Montreal, Parry Sound, Quebec, Toronto.

29. Dunstable, Clinton, Birnam, Sussex, St. Stephen, Port Hastings, Crescent Lake, Halifax, St. John, Chatham, N.B.

30. Charlottetown, Yarmouth, Wolfville.

31. Georgetown, Westport, Deer Park, Westminster, Wesley, Waitefield, Agincourt, Bancroft, Otonabee, Renfrew, Paris, Madoc, East Toronto, Clinton, Brantford, Birnam, Bruce Mines, Aurora, Port Dover, Providence Bay, Father Point, Montreal, Port Stanley, Toronto, Ottawa, Kingston, Lindsay, Barrie.

#### FORECASTS FOR MAY, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1294. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta.....	81	65	11	4	86.9
Saskatchewan.....	85	69	15	1	86.9
Manitoba.....	90	73	13	4	88.3
Lake Superior.....	118	82	28	8	81.4
Georgian Bay.....	120	96	20	1	88.3
Ottawa Valley.....	111	89	19	3	88.7
Upper St. Lawrence.....	111	89	19	3	88.7
Lower Lakes.....	120	92	23	5	86.2
Lower St. Lawrence.....	110	81	22	7	83.6
Gulf.....	110	77	25	8	81.4
Maritime Provinces West.....	117	78	29	10	79.1
Maritime Provinces East.....	115	81	21	10	80.9
Total.....	1294	973	254	70	84.9

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto.



# Monthly Weather Review.

VOL. XXXV.

JUNE, 1911.

No. 6.

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## GENERAL SYNOPSIS.

To the west of the Fraser River the month of June in British Columbia was a little cooler than usual, but in the eastern portion of the province mean temperatures were either average or a little higher. A frost occurred in many parts of the interior about the 19th or 20th, causing some local damage to vegetables. Rain fell in the interior valleys on from five to nine days, in many instances accompanying thunderstorms. On the northern coast and in northern Vancouver Island, and locally in the Cariboo districts, the rainfall was more than average. Temperatures of 80° or higher were recorded in the lower interior on seven or eight days, and 90° on the 12th at Kamloops, Enderby, Tranquille, and other points in that vicinity.

Warmer weather than is average for June prevailed over the greater part of Alberta. Frost occurred at the end of the first week, and was severe at Athabasca Landing, Lunnford, and other points well to the northward, as well as the higher altitudes in the western portion of the province, in the foothills of the Rockies. At lower elevations and in the eastern portion the frost was light. Thunderstorms, accompanied by heavy rains, occurred frequently during the last two weeks in eastern districts. Hail fell heavily about the 23rd in that district lying to the east of Edmonton and to the north of Medicine Hat. In the southeast the rainfall was very much lighter and at a few points less than normal.

Although light frosts were recorded about the 7th and 9th, and again in eastern Saskatchewan on the 27th, the month was on the whole much warmer in that province than usual. From the 16th to the 21st temperatures of 80° and 90° were registered. In northern and northwestern districts the rainfall was generally heavy, but elsewhere was for the most part less than average. Thunderstorms, accompanied by heavy showers, occurred in most places about the 25th, but very few places recorded hail.

High temperatures and considerably less than normal rainfall in most districts characterized the weather of June in Manitoba. Showers occurred on an average of ten days, but were usually very light. In central-southern districts a heavy rainfall occurred on the evening or night of the 21st, amounting in some localities to between three and four inches. From the 17th to the 23rd high temperatures were recorded daily, exceeding 90° at many places and 100° at a few. 102° was recorded at Aweme on the 19th.

In the Thunder Bay, Rainy River, and Algoma districts of Ontario the month was warmer than average and the rainfall generally very heavy. In the peninsula mean temperatures did not differ very much from average, but in the Ottawa Valley and along the Upper St. Lawrence the weather was somewhat cooler than normal. Throughout the peninsula no rain occurred from about the 15th to near the end of the month, and in consequence the total rainfall was considerably less than normal. In the eastern districts the normal amount was, however, almost generally exceeded.

Mean temperatures were but little below normal in western Quebec, but in the eastern portion of the province were considerably higher. Precipitation was deficient along the Middle St. Lawrence and in northern Quebec.

Throughout the Maritime Provinces the average temperature of the month was higher than normal. From the 12th to the 24th showers were of frequent occurrence in New Brunswick, very severe thunderstorms occurring about the 19th and 20th in many localities. The rainfall in this province was everywhere in excess of normal, but in Nova Scotia, except in the northern counties, there was a deficiency; while in Prince Edward Island conditions were nearly normal.

## ATMOSPHERIC PRESSURE.

The mean value of the atmospheric pressure for June closely approached the normal throughout Canada. On the Lower Mainland and Vancouver Island of British Columbia the average was slightly exceeded, as was also the case from Eastern Alberta to the Rainy River District of Ontario, and very locally in the Upper St. Lawrence Valley; else where the pressure was sub-normal.

Departures from average were small, the extremes being 0.04 of an inch, positive at Victoria, B.C., and negative at St. John, N.B.

## HIGH AREAS.

The high areas of June were of the customary summer type, and passed slowly across the continent. Of the paths of seven which were traced, five were first observed over the North Pacific States, and these drifting eastward to the Lake Region, drew southwards and off the South Atlantic Coast, hovering there for some days. The two remaining areas travelled from the far Northwest, north of the Lake Region and over the Maritime Provinces. Pressure was high along the Pacific Coast for a considerable part of the month.

LOW AREAS.

Ten areas of low pressure were sufficiently well defined to admit of their paths being more or less accurately traced, while there were one or two minor depressions which were too indefinite to chart. One area first appeared in the Yukon Territory, one on the Northern British Columbia coast, one in the interior of British Columbia, one in Northern Alberta, four in the West Pacific States, one in the South Pacific States and one off the South Atlantic coast.

Only three of the areas traversed the continent, while four appear to have dispersed in the Canadian Western Provinces, two over the Great Lakes and one in the Lower Mississippi Valley. The area which appeared in the Yukon Territory on the 8th. after reaching the Maritime Provinces on the 14th, hovered there until the 21st, when it passed to Newfoundland.

## TEMPERATURE.

In the western districts of British Columbia mean temperatures were from  $1^{\circ}$  to  $3^{\circ}$  below the normal, while in the southeast the normal mean was exceeded by from  $1^{\circ}$  to  $2^{\circ}$ . In southern Alberta there was an excess of  $4^{\circ}$  to  $6^{\circ}$ , but in some parts of the north and west less than normal warmth was reported. In Saskatchewan the excess over normal temperature ranged from  $3^{\circ}$  to  $5^{\circ}$ , and in Manitoba was about  $3^{\circ}$ ; in the Lake Superior districts of Ontario and the Georgian Bay counties, about  $2^{\circ}$ . In the peninsula of Ontario both excess and deficiency were reported, but in few cases exceeding  $1^{\circ}$ , while in the eastern counties there was a general deficiency of about  $1^{\circ}$ . Temperatures were nearly normal in Western Quebec, but along the Middle and Lower St. Lawrence were  $2^{\circ}$  to  $3^{\circ}$  higher. An excess of  $2^{\circ}$  to  $3^{\circ}$  was computed for the Maritime Provinces.

*The highest and lowest temperatures recorded in each Province during the month of June, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia, .....	{ 93° at Grand Forks on the 12th... and at Revelstoke on the 1st.. }	25° at Atlin on the 1st, and at Hedley on the 19th.
Alberta, .....	93° at Medicine Hat on the 18th.....	24° at Pembina on the 7th.
Saskatchewan.....	94° at Chaplin on the 19th.....	29° at Quill Lake on the 27th.
Manitola,.....	102° at Aweme on the 19th.....	26° at Pipestone on the 27th.
Ontario,.....	97° at Chatham on the 10th.....	29° 5' at Matheson on the 24th.
Quebec .....	94° at Chicoutimi on the 7th.....	34° 2' at Lake Edward on the 25th.
New Brunswick, .....	86° at St. Stephen on the 9th.....	{ 35° at Dalhousie on the 23rd. 35° at Moncton on the 3rd-11th. 35° at St. Stephen on the 6th-25th.
Nova Scotia,.....	85° at Port Hastings on 5th-12th...	28° at Port Hastings on the 3rd.
P. E. Island, .....	80° at Charlottetown on 19th-26th..	34° 5' at Charlottetown on the 4th.

## PRECIPITATION.

On the northern coast, on northern Vancouver Island and locally in the Cariboo district, the rainfall of British Columbia exceeded the normal, but over the greater part of the province there was a deficiency. In the southeastern districts of Alberta less than the normal rainfall was recorded, but elsewhere there was an excess. Battleford, Prince Albert and Saskatoon reported heavy rainfall, but elsewhere in Saskatchewan there was a slight deficiency. Except at Portage la Prairie and other points in the south-central portion of Manitoba, where a very heavy rainfall measuring about four inches occurred on the 2<sup>nd</sup>, the precipitation of the month in that Province was somewhat less than the normal. Precipitation was heavy in the Lake Superior districts of Ontario, and there were local excesses in the eastern counties, but over the peninsula there was much less than the average rainfall. Along the Middle St. Lawrence and in Northern Quebec there was a deficiency, and also in Nova Scotia, except in the northern counties. In New Brunswick there was a general excess, while in Prince Edward Island the amount was normal.

## WINDS, JUNE, 1911.

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of Gales.	Number of Strong Winds.	Number of Fresh Winds.	GENERAL DIRECTION.
• BRITISH COLUMBIA.							
Victoria.....	7575	542	39	4	3	4	S.W.
Triangle Island.....	5712	699					
Kamloops.....	4724	283	21	0	1	2	
ALBERTA.							
Edmonton.....	4576	213	21	0	1	3	N. & W.
Calgary.....	5317	282	25	1	2	3	
SASKATCHEWAN.							
Prince Albert.....	3886	285	18	0	0	2	S.E.
Swift Current.....	7456	403	33	5	8	5	
Battleford.....	6603						
MANITOBA.							
Winnipeg.....	6130	457	27	1	2	5	26 days only.
ONTARIO.							
Port Arthur.....	6191	486	35	2	5	2	N. & E.
Parry Sound.....	1058	234					S.W.
Pelee Island.....	6607	494	35	3	3	3	N.W.
Toronto.....	7386	510	30	1	6	2	
Guelph.....	6358	377					
QUEBEC.							
Quebec.....	7694	589	33	2	4	3	N.E.
Father Point.....	8351	557	40	6	4	1	W.
Anticosti.....	8391	472	29	2	7	4	S.E.
MARITIME PROVINCES.							
Fredericton.....	4616	376	21	0	3	1	N.W.
St. John.....	6303	440	30	3	3	2	S.
Pt. Lepreaux.....	7562	471	38	5	5	4	E.
Halifax.....	6457	371	32	2	2	3	S.
Flat Point.....	8250	494	29	1	4	4	S.W.
Sable Island.....	10224	604					





[illegible]



\* Stations not furnished with Registering Thermometers.  
a Barometer not reduced to Sea Level.







# PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c. DURING JUNE, 1911.

STATIONS.	TEMPERATURE.				PRECIPITATION.				REMARKS
	Amount in inches	No. of Days or over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days.	Heaviest Fall in Month	
BRITISH COLUMBIA—									
Alkali Lake.	0.63	3	27	0.23	29				Thunder on 13, 21, 22.
Annis.	1.14	10	20	0.36	31				
Beaver Lake.	0.77	5	25	0.25	24				
Coquitlam.	1.76	7	23	0.55	9				
Dennants Island.	0.41	2	28	0.36	26				Thunder on 21.
Ferguson.	3.18	7	23	0.80	21				
Goldstream Lake.	1.03	5	25	0.32	9-26				
Hornby Island.	0.72	6	24	0.32	25				
Hydraulic.	3.92	14	16	1.15	29				
Jordan River.	1.27	6	21	0.69	10				
Jordan River (Bear Creek).	2.06	4	26	1.02	11				
LittleQualicum (French Creek, V.I.).	0.50	2	28	0.25	10-23				
Monte Creek.	0.09	1	29	0.09	30				
Naas Harbour.	3.12	11	19	0.72	8				
Skidegate.	1.69	12	18	0.31	26				
Shawnigan Lake.	0.72	8	22	0.25	26				
ALBERTA—									
Bardo.	3.90	11	19	1.10	30				Thunder on 2. Thunder on 2, 3, 16, 18.
Bismark.	5.85	13	17	1.13	24				
Bruderheim.	1.37	16	14	0.96	3				
Bittern Lake.	3.88	11	19	1.07	21				
Brooks.	6.24	14	16	1.97	25				Thunder on 1, 2. Thunder on 1, 2, 21, 23.
Campsie.	4.56	18	12	1.35	29				
Caldwell.	6.21	8	22	1.46	21				
Dorence.	4.26	11	19	1.50	29				Thunder on 1, 2, 6, 13, 14, 16, 17, 18, 29, 27.
Dunstable.	5.75	19	11	1.39	28				
Grassy Lake.	1.75	5	25	0.60	23				
Jumping Pound.	3.5	9	21	1.59	24				Thunder on 17. Thunder on 3, 5, 12, 13, 15, 22, 21, 29, 30.
Lacombe.	4.67	1	26	1.51	30				
Loch Sloy.	6.34	11	19	3.78	14				
Lyndon.	1.18	9	21	0.21	25-27				
Lineham.	2.50	2	28	1.50	28				
Macleod.	1.06	8	22	1.77	24				Thunder on 21, 29.
Mayercroft.	1.42	15	15	6.18	30				
Mayton.									Thunder on 12, 13, 14, 21, 27. Thunder on 13.
Okotoks.	3.35	10	20	0.75	28				
Pekisko.	2.68	9	21	0.61	24				
Ponoka.	3.90	5	25	2.19	30				Thunder on 2, 12, 13, 14, 21, 28, 29. Thunder on 12.
Priddis.	3.49	11	19	0.80	21				
Playle Creek.	1.77	8	22	0.75	24				Aurora on 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 16, 17, 19, 20, 23, 24. Thunder on 2, 3, 6, 13, 11, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 29, 30.
Sion.	7.60	21	9	1.03	22				
Seven Persons.	5.08	7	23	1.35	30				
SASKATCHEWAN—									
Carmichael.	2.49	7	23	0.70	21				Thunder on 1, 19, 20, 23, 21.
Coule.									
Elm How.									
Forks Swift Current. (Gull Lake).	3.58	11	19	1.20	20				
Gull Lake.	3.80	12	18	0.73	5				
Hamley.									
Kindersley.									
Kelvinhurst.									
Last Mountain.									Thunder on 19.
Maple Creek.	3.91	11	16	0.82	82				
Meadow River.	3.72	9	20	0.90	21				
Willow Creek.									
MANITOBA—									
Cartwright.	2.39	10	20	0.71	3				Thunder on 2, 3, 4, 7, 8, 10, Thunder on 9, 120, 21, 24, 29.
Deloraine.	2.11	9	21	1.50	3-8				
Gretna.	2.16	7	23	0.63	7				Thunder on 3, 10.
Norquay.	2.25	8	22	1.12	8				
Rapid City.	2.28	12	18	0.61	21				Thunder on 2, 3, 4, 7, 20, 25, 28.
Rosebank.	4.67	9	21	2.80	8				
ONTARIO—									
Arden.	1.30	11	19	0.55	12				Thunder on 6, 10, 25.
Deer Park.	1.59	3	27	1.00	8				
Dutton.	1.54	12	18	0.55	23				Thunder on 10, 11, 12, 19, 22.
Ensdale.									
Goderich.	0.41	9	21	0.13	5-13				Aurora on 30. Thunder on 1, 5, 9, 10, 11, 26, 27.
Georgetown.	2.74	7	23	1.21	6				
Grantham.	1.57	6	24	0.67	27				
Grand Valley.	2.30	6	24	0.88	5				
MacCue.	0.71	3	27	0.29	10				
Orangeville.	1.53	4	26	0.99	1				
Princeton.	3.52	7	23	2.05	5				
Sydenham.	1.73	6	24	1.16	1				
Strathroy.	2.40	6	24	1.13	5				Thunder on 7, 20, 27.
Wafford.	2.14	5	25	1.17	5				
Westport.	2.52	4	26	1.2	5				Thunder on 10, 12. Thunder on 1, 11.
Wooler.	1.81	3	27	1.12	5				
Westminster.									
Warton.	2.22	9	21	1.13	2				Thunder on 9, 10.
Wesley.									
QUEBEC—									
Timiskaming.	0.98	5	25	0.61	15				
Kepawa.	1.19	6	21	2.16	11				Thunder on 11, 19.
Quinze Dam.									
Lucerne.	2.60	10	20	0.51	15				Thunder on 11.
Perkins Mills.									
NEW BRUNSWICK—									
Point Escurme.	1.95	8	22	1.03	14				Fog on 29.
NOVA SCOTIA—									
Kentville.	1.40	8	22	0.31	13				
Milton.	2.47	6	24	0.73	14				
South Alton.	2.24	7	23	0.59	1				
White Rock.	1.45	8	22	0.50	1.16				
Liverpool (Indian Gar- dens).	5.9	8	22	0.13	21				



MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
JUNE, 1911.

STATIONS.	Hours Ending															
	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.
Salmon Arm	18	62	67	70	72	71	73	70	61	60	70	76	71	61	52	19
Victoria		62	29	52	59	61	61	63	69	73	71	73	77	77	32	
Nanaimo		61	41	52	53	58	62	66	73	72	68	61	63	67	50	61
Vancouver	65	33	39	39	39	39	52	59	61	65	65	68	70	69	25	
Agassiz			18	30	41	44	47	47	52	56	51	52	55	53	29	
Tranquille	61	67	69	70	77	81	81	81	81	76	72	72	68	63	53	16
Summerland	20	54	65	65	78	74	70	68	65	68	65	67	61	61	38	
Kamloops	66	57	62	68	77	8	77	84	79	73	75	78	68	62	53	10
Edmonton	45	28	51	48	51	58	61	58	47	53	51	48	46	40	34	13
Dunvegan	68	41	55	59	64	59	62	59	58	47	58	52	52	41	38	16
Lethbridge	36	55	65	63	65	73	75	81	8	78	67	69	47	40	25	
Lacombe	44	47	55	66	6	65	72	80	71	51	51	53	51	43	32	17
Medicine Hat	29	61	73	76	70	71	75	75	70	73	75	69	63	49	35	66
Fort Vermilion		22	36	41	62	59	65	66	67	57	56	44	31	16	61	
Battleford		41	21	34	37	45	52	52	53	49	50	53	48	48	37	11
Indian Head	66	46	49	50	56	51	56	49	57	59	55	51	51	56	49	14
Moosejaw	33	45	50	47	41	52	57	57	63	61	62	78	52	61	58	23
Scott	21	44	53	56	62	61	63	66	68	72	67	68	60	57	61	24
Rosheron	41	27	39	45	48	53	61	73	73	68	69	70	67	73	56	12
Brandon		13	38	48	51	58	58	57	61	61	58	53	45	38	14	
Winnipeg	67	44	51	56	61	61	51	54	52	57	51	52	49	51	40	12
Haileybury	21	48	51	52	48	58	56	53	69	70	54	51	53	57	53	65
Woodstock		22	4	52	56	55	56	60	63	63	61	68	67	61	51	10
Lindsay		62	68	21	5	51	5	57	62	62	57	58	46	38	34	
Barrie		33	41	46	43	49	51	57	58	52	53	58	47	51	28	68
Toronto		21	21	32	51	62	68	65	60	67	72	68	69	58	31	61
Kingston	68	22	31	33	40	47	48	50	52	50	53	55	51	45	38	66
Ottawa	68	30	47	50	58	59	57	51	62	63	67	59	58	51	42	
Montreal	61	32	47	61	65	62	63	69	75	68	66	58	32	33	T	
Quebec	60	21	42	46	52	51	61	58	61	67	61	63	56	58	51	63
Sherbrooke	44	45	52	48	51	56	58	54	61	66	71	67	61	58	41	13
Fredericton	65	24	41	42	49	51	59	55	54	46	51	47	40	38	31	12
Charlottetown	64	32	47	51	51	5	48	51	56	52	51	58	52	50	3	61

	Salmon Arm.	Victoria.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Dunvegan.	Lethbridge.	Lacombe.	Medicine Hat.	Ft. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Scott.	Rosheron.	Brandon.	Winnipeg.	Haileybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.	
Registered duration in hours.	246	251	338	218	175	310	279	303	212	232	297	247	280	217	180	236	247	273	262	196	225	237	211	182	202	230	190	223	219	228	218	193	212	
Percentage of possible duration	69	53	49	45	36	67	60	65	42	44	61	49	59	40	36	46	54	55	52	49	46	50	53	39	44	50	41	57	51	48	53	41	45	
Difference from average %		+11	+4		+6										9	+4				5	7		0	15	-5	-6	-13	+11	+4	+2		+0		
Maximum percentage in one day	90	86	80	86	77	90	87	90	88	84	95	83	91	71	85	90	91	93	95	80	80	92	93	81	87	86	91	92	91	91	95	90	83	
Date of maximum	20	19	7	18	12	18	18	16	15	3	10	17	18	26	20	11	11	11	11	11	12	7	2	16	29	17	19	21	17	21	21	23	7	7
No. of days completely clouded.	2	2	1	1	6	1	2	2	4	1	0	3	0	2	2	1	1	0	2	2	4	1	2	3	3	1	8	3	1	2	3	6	1	

*Aurora recorded :—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Minnedosa I.
3. Sion.
4. Sion, Cape Magdalene, Quebec III, Lake Talon IV.
5. Sion.
6. Sion.
7. Sion.
8. Sion, Gravenhurst IV.
9. Sion, Oliver.
10. Sion, Hillsdown IV, Threehills Creek III, Wetaskiwin, Oliver, Glenbryan.
12. Sion, Threehills Creek III, Gravenhurst IV.
13. Threehills Creek IV, Aitkensville IV.
14. Lake Talon.
15. Sion.
16. Sion.
17. Sion.
19. Sion.
20. Sion, Schreiber, Kenora III, Lake Edward, Quebec IV, Haileybury IV.
23. Sion, Haileybury IV.
24. Sion.
27. Aweme IV.
28. Lake Edward, Quebec IV.
30. Georgetown III, Aweme III, Agincourt IV, Port Dover, Chicoutimi, Quebec IV, Father Point III, Barrie IV.

*Thunder recorded :*

1. Dunstable, Caldwell, Campsie, Athabasca Landing, Macleod, Threehills Creek, Waitefield, Quebec.
2. Sion, Dunstable, Caldwell, Bruederheim, Campsie, Bismark, Priddis, Cartwright, Rapid City, Eckville, Macleod, Athabasca Landing, Pagan, Threehills Creek, Waitefield, Hillview, Treherne, Port Dover, Spirit River.
3. Sion, Loch Sloy, Bruederheim, Gretna, Cartwright, Rapid City, Harmattan, Threehills Creek, Waitefield, Hillview, Aweme, Almasippi, Treherne, Quebec, Fort Vermilion.
4. Cartwright, Rapid City, Georgetown, Westminster, Ninga, Oakbank, Stony Creek, Wallaceburg, Port Dover, Point Clark, Lucknow, Hamilton, Brantford, Birnam, Gull Lake, Yarbo, Muenster, Cannington Manor, Glenbryan, Pense, Chaplin, Quill Lake, London, Fredericton, Princeton, Ont., Crescent Lake, Rossland, Clinton.
5. Loch Sloy, Georgetown, Eckville, Harmattan, Carbery, Morden, Almasippi, Treherne, Agincourt, Paris, Port Burwell, Birnam, Aurora, East Toronto, Sussex, Yarbo, Minnedosa, Port Stanley, Toronto, Wolfville.
6. Sion, Dunstable, Deer Park, Crescent Lake.
7. Cartwright, Rapid City, Westport, Hillview, Aweme, Almasippi, Treherne, Regina, Pense, Grand Forks, Hope, Wilmer.
8. Cartwright, Brandon, Hillview, Morden, Aweme, Almasippi, Treherne, Agincourt, Kakabeka Falls, Haliburton, Yarbo, Cannington Manor, Minnedosa, Crescent Lake.
9. Wesley, Georgetown, Paris, Port Dover, Owen Sound, Midland, Lucknow, Kakabeka Falls, Brantford, Bruce Mines, East Toronto, Muenster, Bella Coola, Minnedosa, Southampton, Parry Sound, Port Arthur, Gravenhurst, Deloraine, Barrie.
10. Cartwright, Wesley, Wooler, Georgetown, Emsdale, Deer Park, Aitkensville, Carberry, Almasippi, Agincourt, Renfrew, Madoc, Midland, Lakefield, Lucknow, Kakabeka Falls, Haliburton, Brantford, Aurora, Bruce Mines, Bloomfield, Collingwood, Winnipeg, Minnedosa, Southampton, Parry Sound, Ottawa, Kingston, Toronto, Lindsay, Gravenhurst, Barrie, Crescent Lake, Peterboro' Lake Talon, Clinton.
11. Georgetown, Emsdale, Westminster, Deer Park, Perkins Mills, Quinze Dam, Hillsdown, Threehills Creek, Agincourt, Beatrice, Stony Creek, Port Dover, Montreal River, Madoc, Midland, Lakefield, Lucknow, Haliburton, Brantford, Birnam, Aurora, Bruce Mines, Bancroft, Collingwood, Brome, Shawinigan Falls, Alix, Princeton, Okanagan Mission, Chilcotin, Boswell, Southampton, Parry Sound, Ottawa, Port Stanley, Kingston, Toronto, Montreal, Haileybury, Lindsay, London, Gravenhurst, Delia, Cranbrook, Wilmer, Fort St. James, Shelburne, Peterboro', Lake Talon, Clinton.

12. Loch Sloy, Okotoks, Playle Creek, Priddis, Wooler, Emsdale, Harmattan, Lacombe, Halkirk, Macleod, Threehills Creek, Beatrice, Renfrew, Paris, Port Dover, Orillia, Matheson, Montague, Wiland, Lucknow, Haliburton, Brantford, Birnam, Aurora, East Toronto, Bloomfield, Collingwood, Muenster, Nelson, Grand Forks, Tobacco Plains, Fruttyde, Salmon Arm, Okanagan Mission, Ottawa, Port Stanley, Kingston, Toronto, Montreal, Lindsay, Gravenhurst, Barrie, Peterboro, Lake Talon.

13. Sion, Dunstable, Pekisko, Okotoks, Priddis, Blairmore, Harmattan, Macleod, Renfrew, Midland, Haliburton, Nelson, Shawinigan Falls, Lake Edward, Point Lepreaux, Annis, Rathmullen, Lloydminster, Lost River, Grand Forks, Summerland, Tobacco Plains, Hadley, Revelstoke, Salmon Arm, Okanagan Mission, Chilcotin, St. John, N.B., Yarmouth, Haileybury, Crescent Lake, Gleichen, Peterboro.

14. Sion, Dunstable, Loch Sloy, Okotoks, Priddis, Hillsdown, Athabasca Landing, Halkirk, Pakan, Threehills Creek, Waitefield, Prince, Matheson, Shawinigan Falls, Antigonish, Alix, Rathmullen, Boutin, Glenbryan, Chaplin, Chilcotin, Yarmouth, Grand Manan, Crescent Lake, Delia.

15. Sion, Harmattan, Waitefield, St. Stephen, Lost River, Grand Forks, Sydney, St. John, N.B., Ottawa, Spirit River.

16. Sion, Dunstable, Bruderheim, Eckville, Halkirk, Pakan, Threehills Creek, Wetaskiwin, Waitefield, Peace River Crossing, Boutin, Lloydminster, Sydney, Delia, Spirit River.

17. Sion, Dunstable, Lacombe, Pakan, Waitefield, Shawinigan Falls, Peace River Crossing, Boutin, Lloydminster, Chaplin, Quebec, St. John's, Nfld., Truro, Spirit River, Fort St. James.

18. Sion, Dunstable, Bruderheim, Athabasca Landing, Pakan, Waitefield, North Gower, Copper Cliff, Sherbrooke, St. Stephen, Chaplin, Yarbo, Lloydminster, St. John, N.B., Chatham, N.B., Haileybury, Fredericton, Crescent Lake.

19. Sion, Emsdale, Quinze Dam, Hillsdown, Athabasca Landing, Waitefield, Prince, Hillview, Oakbank, Schreiber, Renfrew, Chaplin, Matheson, Montague, Lucknow, Kakabeka Falls, Brome, D'Israeli, Point Lepreaux, Antigonish, St. Stephen, Gull Lake, Maple Creek, Alix, Rathmullen, Cannington Manor, Glenbryan, Pense, Maple Creek, Minnedosa, St. John, N.B., Ottawa, Port Arthur, Montreal, Grand Manan, Haileybury, Lake Talon.

20. Sion, Dunstable, Cartwright, Westport, Blairmore, Aitkensville, Almasippi, Oakbank, Matheson, Point Lepreaux, Windsor, N.S., Antigonish, Sussex, St. Stephen, Gull Lake, Rathmullen, Glenbryan, Maple Creek, Chaplin, Lost River, Chilcotin, Winnipeg, Halifax, St. John, N.B., Grand Manan, Chatham, N.B., Fredericton, Crescent Lake.

21. Sion, Mayeroff, Okotoks, Caldwell, Priddis, Cartwright, Eckville, Macleod, Threehills Creek, Waitefield, Prince, Bruce Mines, Annis, Ferguson, Alix, Glenbryan, Nelson, Grand Forks, Golden, Tobacco Plains, Nicola Lake, Chilliwack, Hadley, Princeton, Okanagan Mission, Sydney, Charlottetown, Halifax, Delia, Gleichen, Wilmer, Rossland.

22. Sion, Loch Sloy, Emsdale, Eckville, Hillsdown, Harmattan, Halkirk, Loveland, Wetaskiwin, Waitefield, Prince, Beatrice, Schreiber, Port Dover, Madoc, Kakabeka Falls, Haliburton, Brantford, Birnam, Bloomfield, St. Stephen, Annis, Alix, Rathmullen, Lloydminster, Chaplin, Summerland, G. Iden, Chilcotin, Ottawa, Gravenhurst, Cranbrook.

23. Sion, Caldwell, Harmattan, Halkirk, Macleod, Threehills Creek, Waitefield, Prince, Schreiber, Matheson, Madoc, Midland, Lucknow, Kakabeka Falls, Birnam, Bruce Mines, Point Lepreaux, St. Stephen, Gull Lake, Eschazy, Rathmullen, Lloydminster, Glenbryan, Maple Creek, Chaplin, Golden, Tobacco Plains, Southampton, St. John, N.B., Port Arthur, Grand Manan, Truro, Fredericton, Delia, Gleichen.

24. Loch Sloy, Cartwright, Rapid City, Waitefield, Brandon, Almasippi, Oakbank, Schreiber, Birnam, Gull Lake, Peace River Crossing, Muenster, Cannington Manor, Glenbryan, Pense, Maple Creek, Chaplin, Port Stanley, Port Arthur, Crescent Lake, Delia, Cranbrook.

25. Rapid City, Port Dover, Matheson, Muenster, Chaplin, Winnipeg, Crescent Lake, Cranbrook.

26. Georgetown, Macleod, Port Dover, Owen Sound, Haliburton, Birnam, Shawinigan Falls, Minnedosa, Kingston, Barrie.

27. Dunstable, Okotoks, Westport, Georgetown, Deer Park, Threehills Creek, Waitefield, Agincourt, Beatrice, Renfrew, Paris, Montague, Montreal River, Madoc, Midland, Lakefield, Lucknow, Haliburton, Hamilton, Brantford, East Toronto, Brome, Lake Edward, Chaplin, Okanagan Mission, Quebec, Ottawa, Kingston, Toronto, Montreal, Haileybury, Lindsay, Gravenhurst, Rossland, Peterboro.

28. Sion, Priddis, Rapid City, Loveland, Aitkensville, Morden, Chicoutimi, Sherbrooke, Lake Edward, D'Israeli, Chaplin, Grand Forks, Quesnel, Chilcotin, Minnedosa, Berens River, Crescent Lake.

29. Sion, Mayeroff, Loch Sloy, Priddis, Cartwright, Loveland, Hillview, Carberry, Morden, Almasippi, Oakland, Chaplin, Chicoutimi East, Cannington Manor, Grand Forks, Winnipeg, Fredericton.

30. Sion, Loch Sloy, Gretna, Loveland, Schreiber, Kakabeka Falls, Bruce Mines, Muenster, Maple Creek, Chaplin, Quill Lake, Port Arthur, Crescent Lake.



## FORECASTS FOR JUNE, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1215. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta.....	73	58	13	2	88.4
Saskatchewan.....	82	55	20	7	79.3
Manitoba.....	80	58	12	10	89.0
Lake Superior.....	105	66	24	15	74.3
Lower Lake Region.....	117	91	21	5	86.8
Georgian Bay.....	115	93	16	6	87.8
Ottawa Valley.....	107	73	28	6	81.3
Upper St. Lawrence.....	107	82	21	4	86.4
Lower St. Lawrence.....	110	87	19	4	87.7
Gulf.....	111	88	19	4	87.8
Maritime Provinces West.....	104	79	20	5	85.6
Maritime Provinces East.....	104	71	26	7	80.8
Total.....	1215	901	239	75	84.0

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto.

July 26, 1911.



# DEPARTMENT OF MARINE AND FISHERIES, CANADA

## METEOROLOGICAL SERVICE.

# Monthly Weather Review.

VOL. XXXV.

JULY, 1911.

No. 7.

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### GENERAL SYNOPSIS.

In the southern interior of British Columbia there were several very warm days. On the 13th, 14th, 15th, 16th, 24th, 25th and 28th, temperatures exceeded  $90^{\circ}$  and, at a few points,  $100^{\circ}$ ; while on the majority of the remaining days the maxima exceeded  $80^{\circ}$ . At Alberni in the interior of Vancouver Island higher than  $100^{\circ}$  was recorded on the 14th, 15th, 16th and 24th. In the southern portion of the Island, however, no such extreme heat was experienced. In the Cariboo district there were several days on which the temperature did not exceed  $70^{\circ}$  and seven nights during which the thermometer dropped to  $40^{\circ}$  or lower.

Showers occurred frequently during the first week in the Kootenays and in the Okanagan Valley, but the remainder of the month was very dry. There were but few districts in the province where the rainfall of the month was not considerably less than normal.

The month of July was quite cool and wet in Alberta and Saskatchewan. The mean temperatures of the month were about  $5^{\circ}$  lower than the normal in eastern Alberta and in Saskatchewan, and about  $2^{\circ}$  lower in western Alberta, no really warm days occurring till the last week. Showers were of very frequent occurrence throughout the month and were often accompanied by high winds and hail. Frost sufficient to cover water with a thin film of ice occurred in latitude  $52^{\circ}$  on the 20th.

In Manitoba rain occurred on from eight to thirteen days, the total amount exceeding the normal except locally in the southeast. There were more warm days here than in Alberta or Saskatchewan.  $90^{\circ}$  was exceeded on a few days in the first and last weeks, but the mean temperatures were about  $2^{\circ}$  or  $3^{\circ}$  lower than the normal.

Heat of an intensity unprecedented in this province prevailed in Ontario during the first few days of July. In many places in the Peninsula the thermometer registered  $100^{\circ}$  or higher on four successive days.  $109^{\circ}$  was recorded at Stonecliff on the Ottawa River on the 2nd, and  $103^{\circ}$  at Chatham, Stony Creek, Renfrew and Toronto. The heat was greatest during the first six days, but continued very great until the 12th, from which day until the 24th mean daily temperatures fluctuated within a degree of the normal. From the 24th to the 28th the weather was several degrees cooler than normal with night temperatures below  $50^{\circ}$  and at a few places below  $45^{\circ}$ . During the last two days of the month very warm weather again prevailed throughout the province.

In the southwestern counties of Ontario a drought prevailed during the first two weeks, but showers occurred several times during the remainder of the month. Local thunderstorms at the end of the first week relieved the drought somewhat in central and eastern Ontario, while showers occurred on an average of nine days during the last two weeks. The total rainfall of the month was nearly everywhere in the province less than the normal.

During the first twelve days the weather was very warm in western Quebec and along the Middle St. Lawrence, while in the Gulf counties there were fewer days of oppressive heat. Thunderstorms occurred very frequently in some districts, notably at Chicoutimi West where there were thirteen. Some of these were accompanied by violent winds which caused much damage. The total rainfall measured a little less than the normal except in the Gulf counties, where local excess was in every instance due to heavy downpour accompanying a single thunderstorm, and affecting a small area.



In southwestern New Brunswick, Prince Edward Island, and all Nova Scotia except Cape Breton Island, the rainfall of the Maritime Provinces was less than the normal, although well distributed throughout the month. There were many days of high temperature, 90° having been exceeded on from three to six days at points in the interior. The mean temperatures of the month were everywhere four degrees higher than the normal.

#### ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for July was subnormal over Manitoba and the northern districts of Ontario and Quebec, also locally in the Central Valleys of British Columbia; the largest negative departures occurring north of Lake Superior. Positive departures were pronounced in Alberta, where there was a difference of 0.14 of an inch at Edmonton and 0.10 of an inch at Calgary. In other parts of the Dominion where the value was above average the amount of divergence was small.

#### HIGH AREAS.

Anti-cyclonic activity during July was marked over the western parts of the Continent, while east of the Lake Region the usual summer type prevailed. Areas of high barometric pressure were, as a rule, first observed over the Pacific States and British Columbia, and passed into the Western States and Provinces as fairly pronounced systems, thence drifting eastward with diminishing energy.

The courses of areas which were sufficiently well defined for the purpose were charted, to the number of six, in all.

#### LOW AREAS.

The cyclonic systems of the month were generally of the summer type, but one area which crossed the Continent between the 21st and 26th was accompanied in the Lake Region by a storm of violence exceptional for the season of the year.

Most of the areas were first observed over Western Canada and moved eastward, north of the Lake Region to the Gulf of St. Lawrence; some few moved southeast to the Western States, and then recurved northeast to the Gulf of St. Lawrence. One area, apparently of West India origin, passed up the Atlantic Coast and over the Maritime Provinces during the 27th, 28th and 29th.

During the early part of the month an intense heat wave swept over Ontario and Quebec, accompanying the passage of a moderate depression which was drifting slowly eastward north of the Lake Region.

The paths of ten areas were charted, and in addition some local movements were noted in the Pacific Coast Region.

#### TEMPERATURE.

In Vancouver Island, the Kootenays, and the Okanagan Valley the mean temperature of the month was between 1° and 2° above normal, but in the Cariboo region and in the northern districts of British Columbia generally there was a deficiency.

Mean temperatures were about 2° less than the normal in northwestern Alberta, and elsewhere in the same province and in Saskatchewan were 3° to 6° less. From Manitoba a deficiency of 2° was reported.

The exceptional heat of the early days of the month in Ontario was counterbalanced by cool weather in the third week, and resulting mean temperatures were not more than 3° above normal. In Quebec the excess over normal was about 3° and in the Maritime Provinces 4°.

*The highest and lowest temperatures recorded in each Province during the month of July, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia, .....	103° at Alberni on the 14th.....	28° at Wilmer on the 5th.
Alberta, .....	{ 95° at Lawrence on the 25th and at Medicine Hat on the 25th & 26th }	28° at Blairmore on the 5th.
Saskatchewan.....	93° at Kelvindhurst on the 29th .....	32° at Scott Lake on the 12th.
Manitoba,.....	98° at Aweme on the 7th.....	35° at Pierson on the 27th.
Ontario,.....	109° at Stonecliff on the 2nd .....	32° at Matheson on the 17th.
Quebec.....	{ 98° at St. Anne de Bellevue on the 3rd and at Shawinigan Falls on the 9th .....	40° at Abitibi on the 29th.
New Brunswick, .....	{ 95° at Fredericton and Chatham on the 6th.....	45° at Sussex on the 8th.
Nova Scotia,.....	95° at Wolfville on the 6th.....	{ 42° at Port Hastings on the 6th and 18th.
P. E. Island, .....	88° at Charlottetown on the 6th .....	52° at Charlottetown on the 8th.

## PRECIPITATION.

The rainfall was less than the normal over the greater part of British Columbia, but in Alberta, Saskatchewan and Manitoba it was for the most part considerably in excess. Locally, however, there were small deficiencies, as in the neighbourhood of Prince Albert and of Moosomin. There was a pronounced deficiency in Ontario and Quebec, although an excess occurred over several small areas, due in every case to a heavy rain accompanying a single thunderstorm. In the Maritime Provinces excess was confined to northern New Brunswick and Cape Breton Island.

## WINDS, JULY, 1911.

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of Gales.	Number of Strong Winds.	Number of Fresh Winds.	GENERAL DIRECTION.
<b>BRITISH COLUMBIA.</b>							
Victoria.....	5160	437	29	.....	7	8	S.W.
Point Garry.....	6938	427	25	.....	11	12	
Triangle Island.....	7114	478	30	1	.....	.....	
<b>ALBERTA.</b>							
Banff (Sulphur Mt.).....	10576	595	38	4	12	12	S.W.
Calgary.....	5127	389	25	.....	3	7	W.
Edmonton.....	4736	315	19	.....	1	7	W.
<b>SASKATCHEWAN.</b>							
Prince Albert.....	3957	272	19	.....	.....	6	S.W.
Swift Current.....	7312	459	34	1	9	11	S.W. W. N.W.
Qu'Appelle.....	4290	446	19	.....	1	2	
<b>MANITOBA.</b>							
Winnipeg.....	9516	504	30	2	13	11	Variable.
<b>ONTARIO.</b>							
Port Arthur.....	7438	458	32	1	11	8	W.
Parry Sound.....	5184	434	25	.....	1	7	S.W.
Southampton.....	4742	272	25	.....	1	6	S.W.
Woodstock.....	5735	573	30	1	3	11	S.W.
Guelph.....	6413	541	.....	.....	.....	.....	S.W.
Toronto.....	6545	617	32	3	4	7	S.W.
<b>QUEBEC.</b>							
Quebec.....	7797	461	34	3	8	9	S.W.
Father Point.....	8208	687	39	6	9	5	W.
Anticosti.....	8382	450	31	2	12	7	S.E.
<b>MARITIME PROVINCES.</b>							
St. John.....	5851	513	34	1	6	7	S.
Pt. Lepreaux.....	6801	680	38	3	4	5	S.W.
Halifax.....	6964	492	33	2	6	8	W.
Flat Point.....	7743	598	28	.....	11	11	S.W.
Charlottetown.....	5469	332	21	.....	3	6	W.
<b>KEEWATIN.</b>							
The Pas.....	7090	528	30	2	3	10	N.N.W.





10270-2

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, JULY, 1911.

\* Stations not furnished with Registering Thermometers.

[illegible]



ONTARIO—Continued.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c.,  
DURING JULY, 1911.

STATIONS.	TEMPERATURE.					PRECIPITATION.				REMARKS.
	Amount in inches	No. of Days '01 or over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days.	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA—										
Alkali Lake.	1.31	4	27	0.83	6					Thunder on 21, 28.
Annis.	1.68	9	29	0.50	8					Lightning on 6.
Beaver Lake.	0.05	1	31	0.45	6					
Coquitlam.	0.42	4	27	0.27	1					
Denman's Island.	0.17	2	29	0.11	7					
Ferguson.	2.28	7	24	0.70	6					
Goldstream Lake.	0.16	3	28	0.07	1					
Hornby Island.	0.22	2	27	0.18	1					
Hydraulic.	2.30	6	25	1.45	6					
Jordan River.	0.40	4	27	0.22	2					
Jordan River (Bear Creek).	0.51	1	27	0.40	1					
LittleQualicum(French Creek, V.I.).	0.10	1	30	0.10	1					
Monte Creek.	0.52	9	29	0.20	8					
Naas Harbour.	3.58	8	23	1.75	23					
Skidegate.	1.93	4	29	0.70	21					Lightning on 15, 25.
Shawnigan Lake.	0.22	4	27	0.15	2					
ALBERTA—										
Bardo.	1.11	14	17	0.74	6					Thunder on 6, 15, 25. Fog on 1
Bismark.	4.46	9	22	1.08	1					
Broderheim.	3.94	16	15	1.04	16					Thunder on 7.
Bittern Lake.	5.30	16	15	0.76	6					Thunder on 6, 14, 25, 29.
Brooks.	0.95	11	20	0.18	1					Thunder on 10, 16, 17, 22, 23.
Conjuring Creek.	3.19	7	24	0.80	18					
Coutts.										[27, 28, 31.
Cumpece.	1.88	13	18	0.91	17					Thunder on 6, 14, 16, 17, 22, 25.
Caldwell.	2.00	9	22	1.06	30					Thunder on 16.
Dorence.	6.80	12	19	2.10	1					
Dunstable.	1.11	23	8	0.63	16					Thunder on 3, 5, 6, 7, 9, 10, 16.
Grassy Lake.	0.59	2	29	0.40	1					21, 25, 27, 28.
Jumping Pound.	2.64	13	18	0.82	19					
Lacombe.	2.23	3	28	1.20	24					Thunder on 16, 22, 25.
Loch Sloy.	1.90	14	17	0.50	19					Thunder on 10, 16, 17, 22, 23.
Lyndon.	2.40	7	24	0.90	5					
Lineham.	3.00	4	27	1.25	10					
Macleod.	0.54	6	25	0.21	26					
Mayeroff.	1.61	8	23	1.03	30					Thunder on 15, 26.
Mayton.										
Okotoks.	2.31	11	20	0.78	19					Thunder on 2, 11, 25, 29, 29.
Pekisko.	2.61	11	20	0.44	26					Thunder on 15. Fog on 17.
Ponoka.	1.63	13	18	1.54	1					
Priddis.										
Playle Creek.	3.15	13	18	0.95	30					Frost on 4. Hail on 15.
Sion.	3.24	21	10	0.60	1					Aurora on 28, 29, 30, 31.
Seven Persons.	0.70	2	29	0.50	1					Thunder on 4, 5, 6, 7, 8, 12,
Tilley.										11, 15, 16, 20, 21, 22, 24, 25, 27,
Wabamun.										28, 29, 30, 31.
SASKATCHEWAN—										
Carmichael.	1.86	4	27	0.70	9					
Coule.										
Elm How.										
Forks Swift Current (Gull Lake).	1.51	12	19	0.25	4					Thunder on 7, 17.
Gull Lake.	3.16	9	22	0.72	17					
Hanley.										
Kindersley.										
Kelvinhurst.										
Last Mountain.	5.97	6	25	5.00	1					
Maple Creek.	2.34	15	16	0.49	1					
Meadow Lake.	5.23	9	22	1.30	4					
Willow Creek.										
MANITOBA—										
Cartwright.	1.43	9	22	0.51	22					Aurora on 29. Thunder on
Deloraine.	1.33	3	28	0.86	8					7, 8, 14, 29.
Gretna.	1.20	5	26	0.32	23					Thunder on 7.
Norquay.	2.85	10	21	1.31	10					
Rapid City.	1.95	9	22	3.76	7					Thunder on 7, 8, 12, 14, 17, 27,
ONTARIO—										
Deer Park.	2.42	9	22	0.90	10					29.
Dutton.	2.35	6	25	0.65	19					Thunder on 5, 10, 11, 14, 17, 30.
Emsdale.	3.16	11	20	1.35	6					Thunder on 3, 19.
Goderich.										Aurora on 7. Thunder on 5,
Georgetown.	2.05	10	21	0.51	17					16, 17, 19, 21.
Grantham.	1.91	9	22	0.77	18					Thunder on 5, 9, 10, 11, 13, 14,
Grand Valley.	1.91	9	22	0.53	20					16, 19, 30.
MacCue.	1.36	5	26	0.62	17					
Orangeville.	2.62	8	23	1.09	20					
Princeton.	2.37	5	23	0.58	11					Thunder on 10, 11, 11.
Sydenham.	2.07	5	26	0.90	17					
Strathroy.	3.42	7	24	2.08	17					
Watford.	1.93	8	23	0.60	16					[16, 17, 20, 21, 27, 28, 29, 31.
Westport.	1.17	4	27	0.67	17					Thunder on 5, 6, 11, 12, 13, 14, 15.
Wooler.	2.45	6	25	0.77	17					Thunder on 11, 19.
Westminster.	1.81	6	25	0.59	10					Thunder on 10.
Wesley.	2.86	10	21	0.72	17					Thunder on 11, 19.
QUEBEC—										
Lucerne.	0.52	5	26	0.17	26					
Perkins Mills.	2.99	7	21	1.50	1					
Quinze Dam.	3.91	7	21	1.18	25					Thunder on 1.
Timiskaming.	3.11	10	21	0.75	5					
NEW BRUNSWICK—										
Point Escominac.	2.52	6	25	1.05	22					Fog on 1, 5, 19, 20, 21, 25.
NOVA SCOTIA—										
Kentville.	1.22	6	25	0.33	28					Thunder on 12, 22, 25.
Liverpool.	1.31	5	26	0.53	24					
Milton.	0.61	4	27	0.55	25					
South Alton.	2.75	7	24	1.11	12					
White Rock.	1.69	6	25	0.71	12					

MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
JULY, 1911.

STATIONS.	HOURS ENDING															
	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.
Victoria		83	82	66	68	64	70	76	72	68	70	75	73	66	31	
Salmon Arm	00	46	55	63	73	78	83	82	78	78	81	84	75	71	60	11
Nanaimo		61	47	63	68	71	71	72	70	71	73	72	73	72	50	
Vancouver	00	43	36	59	63	61	72	71	69	66	69	69	6	60	33	
Agassiz			96	60	61	63	61	63	62	60	61	61	62	58	29	
Tranquille		63	75	77	83	86	88	92	81	81	81	82	82	75	65	
Summerland	17	65	77	82	82	87	84	81	83	83	81	81	81	75	43	
Kamloops	05	67	78	81	81	81	88	92	84	77	81	76	68	56	47	06
Edmonton	17	34	49	56	61	63	65	70	65	73	65	56	56	48	41	14
Dunvegan		11	39	52	53	51	54	60	55	52	49	53	48	39	38	13
Lethbridge	32	71	72	75	81	81	83	81	75	73	63	61	61	63	59	30
Lacombe	00	41	51	51	59	58	71	69	70	66	61	61	60	61	53	18
Medicine Hat	13	53	70	81	78	79	73	81	78	76	71	61	65	60	48	15
Fort Vermilion		31	49	55	62	68	66	70	66	68	71	73	62	51	39	12
Battleford		07	28	46	49	52	57	45	47	58	39	38	35	32	14	
Indian Head	05	46	63	65	68	76	79	80	70	66	68	67	61	68	53	16
Moosejaw	38	63	67	73	75	76	77	75	75	71	73	72	72	65	57	23
Scott	21	52	56	58	65	68	70	67	65	63	69	61	63	63	58	20
Rosthern	5	50	51	53	56	62	60	67	67	69	57	59	56	55	52	02
Brandon	01	17	52	71	77	82	81	76	78	79	68	61	61	54	20	01
Winnipeg	17	63	67	71	77	85	86	81	67	72	70	64	61	60	49	11
Haileybury	00	46	51	59	61	63	63	55	58	63	59	63	63	55	48	06
Gravenhurst																
Woodstock		29	69	76	80	82	74	77	71	73	73	71	69	67	49	05
Lindsay			58	66	85	86	81	75	67	67	62	61	56	53	49	
Barrie		50	64	71	71	77	73	73	73	61	60	61	60	63	42	01
Toronto		21	43	80	81	82	81	78	67	68	62	68	71	57	31	T
Kingston	06	51	76	81	86	89	93	88	87	88	85	77	71	71	51	02
Ottawa	01	55	77	81	83	81	83	86	86	84	81	78	70	65	42	
Montreal	5	58	75	77	81	83	81	82	81	81	85	87	75	71	35	
Quebec		21	47	56	71	76	72	71	71	72	68	61	55	46	21	T
Sherbrooke		08	61	77	76	77	75	71	75	76	75	71	77	73	71	02
Fredericton	03	22	44	52	62	67	76	77	78	71	77	67	65	58	41	07
Charlottetown	05	42	50	61	71	71	75	77	76	70	75	73	72	57	35	03

	Victoria.	Salmon Arm.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Dunvegan.	Lethbridge.	Lacombe.	Medicine Hat.	Fort Vermilion.	Battleford.	Indian Head.	Moosejaw.	Scott.	Rosthern.	Brandon.	Winnipeg.	Haileybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.
Registered duration in hours.	274	319	271	273	226	340	342	331	259	288	339	268	313	262	162	267	325	289	271	275	313	257	399	289	273	278	312	327	327	253	315	270	2
Percentage of possible duration.	56	65	55	56	46	69	70	67	51	40	67	53	61	50	32	60	69	57	53	61	61	53	65	57	58	69	73	69	75	53	67	57	
Difference from average.	+ 0				- 1										- 26	- 5					0	- 8	+ 12	- 0	- 1	+ 6	+ 16	+ 17	+ 16			+ 3	
Maximum percentage in one day.	86	91	82	88	80	92	90	91	95	82	98	90	93	82	75	90	90	91	91	80	91	92	91	86	88	88	96	87	98	89	97	93	
Date of maximum.	13	13	13	13	17	23	23	13	21	20	13	25	5	15	21	6	20	21	28	6	13	7	18	18	28	20	7	4	27	7	7	26	
No. of days completely clouded.	1	0	2	3	8	0	0	0	2	5	0	0	0	1	3	1	0	1	3	0	1	1	0	0	0	0	1	1	0	1	0	2	



*Aurora recorded: —*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Aweme III, Aitkensville IV, Port Arthur I, Stonecliff II.
2. Dauphin
6. Aitkensville IV, Agincourt IV, Kakabeka Falls III, Lake Talon, Quebec III, Ottawa II.
7. Wetaskiwin II, Lake Talon III, Schreiber, Emsdale IV, Quebec III, Port Arthur II, Ottawa II, St. John III, Cape Magdalen.
18. Aitkensville IV, Montague, Chaplin IV, Quebec III, Crescent Lake III.
19. Threehills Creek II.
21. Aitkensville IV, Crescent Lake IV.
22. Dauphin.
24. Crescent Lake IV.
26. Threehills Creek III.
27. Aweme II, Aitkensville III, Kakabeka Falls IV, Haileybury II, Yarbo III, Glenbryan I, Estevan IV, Quebec IV.
28. Waitefield III, Aweme II, Aitkensville III, Dauphin, Montague, Lake Talon IV, Renfrew, Sion IV, Haileybury IV, Yarbo IV, Waseca, Winnipeg III.
29. Kakabeka Falls III, Sion III, Haileybury III, Crescent Lake IV.
30. Waitefield III, Sion IV.
31. Sion IV, Yarbo IV.

*Thunder recorded:*

1. Pincher Creek, Morden, Carberry, Montague, Lake Talon, Perkins Mills, Haileybury, Chaplin, Minnedosa, Nelson.
2. Hillsdown, Halkirk, Red Deer, Waitefield, Threehills Creek, Montague, Chicoutimi, Lake Edward, Okotoks, Ottawa, Fort St. James, Nelson, Delia.
3. Harmattan, Halkirk, Pakan, Loveland, Waitefield, Threehills Creek, Hillview, Carberry, Aitkensville, Lucknow, Renfrew, Chicoutimi, Lake Edward, D'Israeli, Shawinigan Falls, Moncton, Dunstable, Dutton, Fredericton, Quebec, Father Point, Port Stanley, Chatham, N.B., Delia.
4. Harmattan, Eckville, Hillsdown, Halkirk, Red Deer, Threehills Creek, Morden, Almasippi, Aitkensville, Bruce Mines, Schreiber, Providence Bay, Sion, Fredericton, Truro, Chaplin, Halifax, St. John, Yarmouth, Charlottetown, Grand Manan, Delia.
5. Morden, Agincourt, Burnam, Brantford, Montreal River, Madoc, East Toronto, Haliburton, Kakabeka Falls, North Gower, Peterboro, Uplands, Lake Edward, Pt. Lepreaux, Dunstable, Sion, Westport, Deer Park, Emsdale, Georgetown, Guelph, Haileybury, Toronto, Quebec, Barrie.
6. Athabasca Landing, Eckville, Hillsdown, Halkirk, Pakan, Loveland, Waitefield, Wetaskiwin, Birnam, Madoc, Montague, Lucknow, East Toronto, Peterboro, Orillia, Renfrew, Brome, St. Stephen, Moncton, Campsie, Dunstable, Bardo, Grand Manan, Golden, Princeton, Quesnel, Bittern Lake, Sion, Westminster, Westport, Fredericton, Gravenhurst, Haileybury, Lindsay, Rathmullen, Lloydminster, Chaplin, Montreal, Quebec, Ottawa, Port Stanley, Southampton, Stonecliff, Halifax, St. John, Sydney, Chatham, N.B., Charlottetown, Fort Vermilion, Barrie, Shelburne.
7. Hillsdown, Halkirk, Loveland, Hillview, Brandon, Morden, Aweme, Almasippi, Carberry, Treherne, Oakbank, North Gower, Dunstable, Bruederheim, Sion, Cartwright, Rapid City, Gretna, London, Gull Lake, Lloydminster, Chaplin, Winnipeg, Minnedosa, Grand Forks, Rossland, Fort Vermilion, Crescent Lake.
8. Harmattan, Halkirk, Hillview, Morden, Aweme, Almasippi, Carberry, Aitkensville, Dauphin, Treherne, Oakbank, Kakabeka Falls, Schreiber, Sion, Cartwright, Rapid City, Yarbo, Chaplin, Minnedosa.
9. Halkirk, Pincher Creek, Haliburton, Schreiber, Point Clark, Orillia, Chicoutimi, Dunstable, Georgetown, Gravenhurst, Lindsay, Winnipeg, Rossland, Barrie.
10. Agincourt, Birnam, Brantford, Madoc, Lucknow, East Toronto, Paris, Peterboro, Brome, Chicoutimi, Lake Edward, Shawinigan Falls, Pt. Lepreaux, St. Stephen, Dunstable, Princeton, Deer Park, Georgetown, Hamilton, London, Lindsay, Toronto, Father Point, Ottawa, Port Stanley, Loch Sloy, Cape Magdalen, Clarke City.
11. Hillsdown, Pakan, Lunnford, Waitefield, Stony Creek, Agincourt, Birnam, Aurora, Bloomfield, Brantford, Madoc, East Toronto, North Gower, Paris, Port Burwell, Peterboro, Chicoutimi, Okotoks, Princeton, Westport, Deer Park, Wooler, Georgetown, Hamilton, London, Lindsay, Rathmullen, Chaplin, Kingston, Toronto, Father Point, Port Stanley, St. John, Sydney, Chatham, N.B., Charlottetown, Grand Manan, Fort Vermilion.
12. Harmattan, Almasippi, Kakabeka Falls, Windsor, N.S., Sion, Rapid City, Westport, Kentville, Truro, Wolfville, Halifax, Yarmouth, Sydney.

13. Agincourt, Aurora, Montreal River, Matheson, East Toronto, Lake Talon, Port Dover, Point Riche, Westport, Georgetown, Haileybury, Kingston, Toronto, Quebec, Cape Magdalen, Fort Vermilion.

14. Lunnford, Waitefield, Hillview, Morden, Almasippi, Ninga, Stony Creek, Agincourt, Bruce Mines, Aurora, Brantford, Midland, Lucknow, East Toronto, Paris, Orillia, Chicoutimi, Lake Edward, Campsie, Bittern Lake, Sion, Cartwright, Rapid City, Princeton, Westport, Deer Park, Georgetown, Wesley, London, Haileybury, Lindsay, Yarbo, Muenster, Chaplin, Toronto, Southampton, Crescent Lake.

15. Threehills Creek, Macleod, Morden, Birnam, Bruce Mines, Madoc, Montague, Lucknow, Schreiber, Providence Bay, Peterboro, Renfrew, Brome, Chicoutimi, Cape Chatte, Chicoutimi, Pekisko, Mayeroft, Bardo, Sion, Westport, Haileybury, Kingston, Toronto, Port Stanley, Cape Magdalen, Clarke City.

16. Eckville, Hillsdown, Halkirk, Alix, Pincher Creek, Red Deer, Pakan, Loveland, Lunnford, Waitefield, Threehills Creek, Agincourt, Birnam, Lucknow, East Toronto, Haliburton, Owen Sound, Paris, Point Clark, Brome, Chicoutimi, D'Israeli, Campsie, Dunstable, Lacombe, Caldwell, Sion, Westport, Emsdale, Georgetown, Lindsay, Montreal, Kingston, Toronto, Quebec, Father Point, Port Stanley, Stonecliff, Loch Sloy, Delia, Clarke City.

17. Harmattan, Pincher Creek, Threehills Creek, Peterboro, Brome, Lake Edward, Sherbrooke, Campsie, Rapid City, Westport, Deer Park, Emsdale, Gravenhurst, Lindsay, Gull Lake, Glenbryan, Montreal, Kingston, Loch Sloy.

18. Pincher Creek, Aitkinsville, Providence Bay, Chicoutimi, Yarbo, Crescent Lake.

19. Pincher Creek, Hillview, Almasippi, Carberry, Dauphin, Agincourt, Birnam, Bruce Mines, Aurora, Madoc, Matheson, Midland, Lucknow, Haliburton, Kakabeka Falls, Lake Talon, Peterboro, Port Dover, Uplands, Pt. Lepreaux, Wooler, Emsdale, Georgetown, Wesley, Dutton, Gravenhurst, Haileybury, Lindsay, Lost River, Chaplin, Kingston, Toronto, Port Arthur, Port Stanley, Stonecliff, Crescent Lake, Barrie.

20. Pincher Creek, Matheson, Sion, Westport, Port Stanley, Chilcotin, Clarke City.

21. Hillsdown, Alix, Threehills Creek, Macleod, Montreal River, Montague, Lake Talon, Uplands, Brome, Chicoutimi, Lake Edward, Shawinigan Falls, Windsor, N.S., Dunstable, Sion, Westport, Wolfville, Chaplin, Quebec, Ottawa, Alkali Lake, Summerland, Fort St. James, Chilcotin, Revelstoke.

22. Harmattan, Blairmore, Pincher Creek, Red Deer, Loveland, Macleod, Chicoutimi, Campsie, Lacombe, Sion, Kentville, Truro, Wolfville, Glenbryan, Chaplin, Quebec, Halifax, St. John, Chatham, N.B., Loch Sloy, Delia.

23. Point Clark, Chicoutimi, Fredericton, Montreal, St. John, Charlottetown, Loch Sloy.

24. Bruce Mines, Haliburton, Lake Talon, Providence Bay, Chicoutimi, Moncton, Sion, Emsdale, Fort Vermilion.

25. Loveland, Lunnford, Waitefield, Wetaskiwin, Chicoutimi, Campsie, Okotoks, Dunstable, Lacombe, Bardo, Bittern Lake, Sion, Kentville, Kingston, Halifax, Fort Vermilion.

26. Harmattan, Waitefield, Threehills Creek, Macleod, Aweme, Okotoks, Mayeroft, Lloydminster, Delia.

27. Pincher Creek, Waitefield, Wetaskiwin, Morden, Aweme, Almasippi, Oakbank, Campsie, Dunstable, Sion, Rapid City, Westport, Chaplin.

28. Pakan, Loveland, Waitefield, Ninga, Chicoutimi, Campsie, Dunstable, Sion, Westport, Alkali Lake, Revelstoke.

29. Hillsdown, Red Deer, Loveland, Waitefield, Threehills Creek, Wetaskiwin, Hillview, Almasippi, Oakbank, Brantford, Paris, Okotoks, Bittern Lake, Sion, Cartwright, Rapid City, Westport, London, Ottawa.

30. Pincher Creek, Hillview, Oakbank, Agincourt, Peterboro, Renfrew, Sion, Deer Park, Georgetown, Fredericton, Haileybury, Yarbo, Chaplin, Toronto, Quebec, Chatham, N.B., Peace River Crossing, Fort Vermilion, Crescent Lake.

31. Hillsdown, Pincher Creek, Waitefield, Threehills Creek, Bruce Mines, Kakabeka, Schreiber, Renfrew, Pt. Lepreaux, Campsie, Sion, Westport, Fredericton, St. John, Charlottetown, Grand Manan, Fort St. James, Nicola Lake, Okanagan Mission, Princeton, Fort Vermilion.

## FORECASTS FOR JULY, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1235. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta.....	76	64	6	6	88.2
Saskatchewan.....	76	69	5	5	90.1
Manitoba.....	79	71	3	5	91.3
Lake Superior.....	119	99	16	4	89.9
Lower Lake Region.....	119	97	15	7	87.8
Georgian Bay.....	119	98	11	7	83.2
Ottawa Valley.....	96	82	8	6	89.6
Upper St. Lawrence.....	95	84	7	4	92.1
Lower St. Lawrence.....	103	88	6	9	88.3
Gulf.....	107	85	10	12	81.1
Maritime Provinces West.....	123	96	18	9	85.4
Maritime Provinces East.....	123	97	15	11	85.0
Total.....	1235	1027	123	85	88.1

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto.

August 26, 1911.





# Monthly Weather Review.

VOL. XXXV.

AUGUST, 1911.

No. 8.

## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## GENERAL SYNOPSIS.

Showers occurred frequently during the first and last weeks in southern British Columbia. Temperatures were a little higher than usual in the southwestern portion of that province, but elsewhere were a little lower than the average, especially in the Cariboo district, where night temperatures fell below 40° on 8 days.

The month of August was remarkable for the amount of precipitation in the western provinces. Rain or hail was recorded at many places on 16 days, while a few observers reported rain falling continuously to a depth of 3 inches, a very rare occurrence in western Canada. The weather was about 4° cooler than is usual for August, while frosts occurred in many districts during the last week.

In eastern Manitoba and in Ontario weather conditions did not differ very much from normal, but in Quebec mean temperatures were about 3° higher than usual, while the rainfall was deficient.

In northern New Brunswick the rainfall was locally heavy, but elsewhere in the Maritime Provinces there was a general deficiency of precipitation. The month was warmer than usual, especially the first week, when at many places temperatures of 80° to 85° were recorded each day.

## ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for August exceeded the normal throughout the greater part of Canada, with the greatest departures over the western provinces, where differences were between 0.04 and 0.11 of an inch. In Ontario and Quebec the normal was just reached in a few localities, but generally the value was slightly in excess.

## HIGH AREAS.

Five areas of high pressure were sufficiently well marked to allow of their paths being traced. Two first appeared in the vicinity of the Yukon Territory, one in northern British Columbia, one in the North Pacific States and one passed into the Maritime Provinces from Labrador. The course of four areas was over the Great Lakes, thence to the Atlantic seaboard. The system which appeared in northern British Columbia on the 24th was the most pronounced of the series, and as it passed over Ontario between the 29th and the 30th it brought the first light frosts of the season in a few northern parts of the province.

## LOW AREAS.

Nine areas of low pressure were sufficiently well defined to allow of their paths being traced while there were one or two minor depressions which could not be tracked with any degree of certainty.

Two areas first appeared in southern British Columbia, two in the west Pacific States, two in the south Pacific States, one in the Province of Quebec, one in the State of Maine and one off the South Carolina coast.

The areas which appeared in the State of Maine and in Quebec, respectively, developed with remarkable rapidity, causing stormy conditions in the Gulf of the St. Lawrence and in the Maritime Provinces. The area which was first shown off the Carolina coast and which was apparently of tropical origin, moved a little inland with diminished intensity, but subsequently, between the 31st of the month and the 1st of September, traversed southern Nova Scotia and Newfoundland while quickly re-developing, and caused heavy weather in the Gulf of the St. Lawrence and over Newfoundland. The remaining six areas in nearly all instances passed either over the western provinces or far to the northward of Ontario and Quebec, and were chiefly noticeable for their accompanying frequent and often heavy rainfalls from the Rocky Mountains to Manitoba.

## TEMPERATURE.

In the extreme southwestern portion of the mainland of British Columbia and on Vancouver Island the mean temperature of the month was either normal or a little above, but over the remainder of the province was from 1° to 2° below. Throughout the Prairie Provinces the month was cooler than usual, mean temperatures falling from 3° to 5° below normal in Alberta and Saskatchewan and from 2° to 3° below in western Manitoba: in the eastern portion of the latter province, however, conditions were nearly average.

In the Lake Superior districts of Ontario the differences from normal were very small, but over the remainder of the province there was an excess over normal mean of about 2°.

The normal mean temperature of August was exceeded by about 3° in Quebec and Newfoundland, and by from 1° to 2° in the Maritime Provinces.

*The highest and lowest temperatures recorded in each Province during the month of August, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia.....	{ 94° at Grand Forks and Greenwood Plate) on the 18th, on the 8th and 23rd, Cranbrook on 14th and 19th.	30° at Hedley (Nickel)
Alberta.....	92° at Medicine Hat on the 19th.....	26° at Gilt Edge on the 27th.
Saskatchewan.....	94° at Broadview on the 14th.....	{ 26° at Grenfell & Waseca on the 27th.
Manitoba.....	{ 94° at Aweme on the 13th and at Moose Horn Bay on the 14th.....	{ 31° at Aweme on the 28th.
Ontario.....	97° at Lorne Park on the 7th.....	25° at Uplands on the 30th.
Quebec.....	{ 94° at Ste. Anne de Bellevue on the 1st and at Shawinigan Falls on the 6th.....	{ 33° at Clarke City on the 19th.
New Brunswick.....	92° at Chatham on the 4th.....	39° at Moncton on the 30th.
Nova Scotia.....	89° at Wolfville on the 10th.....	38° at Antigonish on the 31st.
P. E. Island.....	90° at Charlottetown on the 5th.....	44° at Charlottetown on the 31st.

## PRECIPITATION.

The precipitation recorded during the month of August was in excess of average in southern British Columbia, the western provinces, the southern counties of the peninsula of Ontario and New Brunswick. Less than the normal amount was reported from the greater part of Ontario, Quebec, Nova Scotia and Prince Edward Island. Exceptionally heavy rain-falls occurred locally in Alberta and Manitoba during the first week.



## WINDS, AUGUST, 1911.

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of days with Gales	Number of days of Strong Winds.	Number of days of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Victoria.....	6117	372	23	.....	9	14	S.W.
Point Garry.....	6243	373	21	.....	7	19	E.
Triangle Island.....	3762	295	18	.....	.....	.....	S.W.
ALBERTA.							
Banff (Sulphur Mt.).....	9328	895	61	8	5	7	W.
Edmonton.....	3244	257	15	.....	.....	4	E.
Calgary.....	4584	431	31	.....	3	5	W.
SASKATCHEWAN.							
Prince Albert.....	3233	273	21	.....	1	2	W.
Swift Current.....	5171	399	21	.....	2	12	S., S.W.
Qu'Appelle.....	5152	295	21	.....	4	11	W.
MANITOBA.							
Winnipeg.....	6884	407	26	.....	6	12	S.
ONTARIO.							
Port Arthur.....	6186	361	20	.....	1	14	N.W.
Parry Sound.....	4337	249	22	.....	1	8	S.W.
Southampton.....	4719	366	26	.....	2	6	S.
Woodstock.....	4580	360	20	.....	2	6	N.W.
Guelph.....	5540	361	.....	.....	.....	.....	N.W.
Toronto.....	6615	451	29	.....	5	13	N., N.W.
QUEBEC.							
Quebec.....	8251	419	41	1	13	11	N.E.
Father Point.....	8982	684	40	7	12	4	W.
MARITIME PROVINCES.							
Fredericton.....	5002	379	24	.....	3	9	W.
St. John.....	6479	539	38	1	8	3	S.W.
Pt. Lepreaux.....	746	575	40	4	7	7	W.
Halifax.....	6715	518	12	2	5	10	W.
Sable Island.....	9987	743	.....	.....	.....	.....	S.W.
Flat Point.....	9170	660	11	3	11	12	S.W.
Charlottetown.....	5327	378	25	.....	4	5	S.W.

TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, AUGUST, 1911

\* Stations not furnished with registering thermometers.

[illegible]

[illegible]









# PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, AUGUST, 1911.

a Barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

STATION.	Latitude N.	Longitude W.	Elevation above sea level, in feet.	Pressure.			Temperature.						Mean temperature of month.			No. of days completely clouded.	Direction of wind from.								Velocity of wind.			Precipitation.			No. of days with rain or more.	No. of days with snow or more.	No. of days with hail or more.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
				Mean reduced.	Highest.	Lowest.	Range.	Mean.	Difference from average.	Years observed.	Highest.	Date.	Lowest.	Date.	Mean daily range.		Mean relative humidity.	Mean amount of cloud.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	C.	Total number of observations.	Mean miles per hour.	Highest day's velocity.				Date and direction from.	Amount.	Difference from average.	Highest fall in month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c.,  
DURING AUGUST, 1911.

STATIONS.	RAINFALL.					SNOWFALL.				REMARKS.
	Amount in inches	No. of Days or over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days	Heaviest Fall in Month	Date.	
BRITISH COLUMBIA—										
Alkali Lake.....	2.22	10	21	1.17	19					Thunder on 19.
Annis.....	1.11	7	21	0.50	7					Thunder on 1, 15, 19.
Beaver Lake.....	0.70	2	29	0.58	19					
Cochitlam.....	1.57	5	26	0.78	19					
Donnan's Island.....	0.71	4	27	0.29	7					
Ferguson.....	2.02	7	21	0.47	8					
Goldstream Lake.....	0.76	1	27	0.16	19					
Hydraulic.....	2.21	7	24	0.92	20					
Hornby Island.....	0.75	3	28	0.10	7					
Jordan River.....	0.60	2	29	0.50	19					
Jordan River (Bear Creek).....										
LittleQualicum(French Creek, V.I.).....	0.87	3	28	0.59	19					
Monte Creek.....	1.06	6	25	0.80	7					
Naas Harbour.....	3.13	5	26	1.00	27					
Skidegate.....										Thunder on 12, 23.
Shawnigan Lake.....	0.60	1	27	0.15	20					
ALBERTA—										
Bardo.....	2.28	8	23	0.82	20					Thunder on 29.
Bismark.....	4.17	9	22	1.83	20					[20, Fog on 22.
Bruderheim.....	3.98	11	17	1.70	21					Aurora on 22, Thunder on
Bittern Lake.....	4.13	11	20	2.48	21					Thunder on 20.
Brooks.....	2.61	11	20	0.70	25					
Conjuring Creek.....										
Coutts.....										
Campsie.....	1.77	10	21	0.61	20					Thunder on 30.
Caldwell.....	4.37	13	18	0.93	3					[19, 25, 27, 28, 29, 30, 31.
Dorendee.....	5.20	7	21	0.42	21					Thunder on 1, 10, 12, 11, 15, 18.
Dunstable.....	2.18	17	14	0.73	20					
Grassy Lake.....	2.50	1	30	2.50	11					
Jumping Pound.....										
Lacombe.....										Thunder on 21.
Loch Sloy.....	5.13	16	15	1.57	1					
Lyndon.....	6.29	9	22	1.26	6-7					1 inch snow fell on 20.
Lineham.....	1.50	11	19	—	—					
Macdon.....	3.61	10	21	1.13	7					Fog on 5, 9, 26.
Mayeroff.....	1.08	13	18	2.13	8					
Okotoks.....	3.56	8	23	1.47	7					Thunder on 15, 19.
Pekisko.....	5.51	13	18	2.28	7					
Ponoka.....	2.87	7	24	2.17	20					
Priddis.....										[Fogs.
Playle Creek.....	3.79	15	16	1.21	7					11 Auroras, 13 Thunder, 1
Sion.....	2.58	15	16	0.91	19					
Seven Persons.....	1.45	3	28	0.70	9					
Tilley.....										
Wabamun.....										
SASKATCHEWAN—										
Carmichael.....										
Coulee.....										
Elm Row.....										
Forks Swift Current.....	1.77	7	24	0.83	4					
(Gull Lake).....										
Gull Lake.....	1.83	6	25	0.51	7					
Gravelbourg.....	2.83	7	21	2.15	7					
Hailey.....										
Kindersley.....										Thunder on 15, 20, 31.
Last Mountain.....	2.51	10	21	0.53	26					
Maple Creek.....	1.61	9	22	0.77	8					
Meadow Lake.....	2.51	6	25	1.02	31					
Willow Creek.....										[on 12, 21, 31.
MANITOBA—										
Cartwright.....	2.92	11	20	1.41	3					Aurora on 22, 24, Thunder
Deloraine.....										
Gretna.....	2.16	10	21	0.70	6					Thunder on 12, 15, 30. [on 28.
Norquay.....	1.69	11	20	0.65	4					Thunder on 3, 11, 15, 21, Frost
Rapid City.....	1.83	8	23	2.10	3					Thunder on 1, 15, 20, 30.
ONTARIO—										
Deer Park.....	2.19	8	23	0.93	27					Thunder on 1, 8, 27.
Dutton.....	1.73	6	25	0.18	10					Thunder on 10, 14.
Emsdale.....	2.23	9	22	0.57	7					Thunder on 1, 2, 7, 8, 15, 16, 18.
Georgetown.....	1.31	11	20	0.36	3					Aurora on 23, Thunder on 1
Grantham.....	2.13	11	20	0.54	4					[2, 3, 6, 10, 16, 17, 18, 27, 28.
Grand Valley.....	3.14	13	18	0.87	6					
MacCue.....	1.77	5	26	0.75	15					
Orangeville.....	3.70	6	25	1.61	1					Thunder on 11, 15, 28.
Princeton.....	1.48	4	27	0.51	4					
Sydenham.....	1.60	5	26	0.71	16					
Stralbrov.....	2.72	8	23	0.98	15					[16, 17, 18, 24, 27.
Watford.....	2.35	7	24	0.58	15					Thunder on 2, 5, 6, 7, 8, 15.
Westport.....	1.32	7	24	0.40	28					
Wooler.....	0.99	5	26	0.10	28					Thunder on 28.
Westminster.....	2.79	4	27	1.31	16					Thunder on 6, Fog, on 3
Wesley.....	2.57	10	21	0.58	1					[Frost on 30.
QUEBEC—										
Lucerne.....	1.32	6	25	0.18	8					Thunder on 8, 16, 27.
Perkins Mills.....	1.82	6	25	0.71	8					Thunder on 8, 14.
Quinze Dam.....	3.71	10	21	1.28	8					Thunder on 9.
Timiskaming.....	3.63	11	20	1.71	8					
NEW BRUNSWICK—										
Point Escominac.....	2.41	6	25	1.08	17					Fog on 8, 31.
NOVA SCOTIA—										
Kentville.....	3.23	5	26	1.07	19					Thunder on 15, 19.
Liverpool.....	2.32	5	26	1.61	16					
Milton (Rapid Falls Mill).....	2.16	4	27	1.62	16					
South Alton.....	3.83	7	24	1.41	19					
White Rock.....	3.77	7	21	1.06	16					

MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
AUGUST, 1911.

STATIONS.	HOURS ENDING															
	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.
Victoria	T	32	33	33	71	78	78	80	82	83	75	72	53	43		
Salmon Arm		22	33	62	61	72	73	71	76	76	69	71	67	59	53	
Nanaimo																
Vancouver		15	36	41	48	46	51	57	56	68	72	76	72	59	45	
Agassiz			17	40	44	46	48	50	62	60	59	57	48	27	01	
Tranquille																
Summerland		41	66	62	67	69	69	67	66	67	62	57	58	45	01	
Kamloops	01	26	42	47	51	61	62	73	76	69	61	66	53	50	19	
Edmonton		16	40	42	51	46	58	69	62	59	63	65	52	55	25	
Lethbridge	01	13	58	60	60	64	69	72	66	62	69	63	66	53	41	02
Lacombe		29	48	50	47	58	61	62	63	62	58	65	60	53	41	01
Medicine Hat		26	63	67	75	78	77	75	73	67	67	59	67	52	27	
Fort Vermilion		02	22	43	48	57	64	68	71	66	63	65	62	44	20	
Battleford			67	36	53	56	56	53	48	42	38	40	41	37	07	
Indian Head		18	48	55	64	65	65	59	67	62	62	63	65	48	24	
Moosejaw	03	44	66	73	71	74	77	79	76	76	74	69	67	63	39	
Scott		33	53	67	73	81	76	75	72	76	82	73	71	64	44	01
Rosthern		21	57	72	77	77	81	76	80	77	73	72	64	61	21	05
Brandon		03	41	74	76	79	79	77	68	70	69	69	62	55	43	05
Winnipeg		12	40	60	70	72	72	74	75	75	68	71	68	60	37	01
Haileybury	T	42	64	71	76	77	89	78	70	73	74	61	57	57	40	01
Gravenhurst		01	26	27	44	67	77	72	74	68	67	64	51	33	17	01
Woodstock		10	15	53	67	73	71	71	73	70	69	57	53	44	06	
Lindsay			04	30	62	74	76	70	78	81	76	39	43	38	20	
Barrie		04	53	70	73	78	77	79	74	73	67	63	58	48	01	
Toronto	T	20	63	70	75	77	80	83	83	83	78	73	65	48	32	
Kingston		15	53	63	65	67	66	70	74	73	69	61	54	47	24	T
Ottawa		20	52	63	65	75	83	83	87	85	72	69	72	58	46	
Montreal		25	53	68	72	77	75	72	80	84	84	81	74	59	05	
Quebec		05	35	53	62	73	78	73	73	72	70	60	56	45	15	
Sherbrooke		17	55	68	70	79	70	66	71	66	59	54	52	47	21	
Fredericton	T	16	40	53	56	62	65	66	67	63	56	50	52	49	35	03
Charlottetown		24	43	47	54	62	66	64	71	74	66	66	56	48	21	

	Victoria.	Salmon Arm.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Ft. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Scott.	Rosthern.	Brandon.	Winnipeg.	Haileybury.	Gravenhurst.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.	
Registered duration in hours.	238	296		225	178		217	237	218	261	235	267	244	151	236	263	262	283	246	265	284	213	236	244	253	230	248	279	280	236	246	227	234	
Percentage of possible duration .....	58	60		50	40		76	53	48	50	52	60	46	33	53	65	65	63	55	60	65	49	55	50	50	60	57	63	60	54	56	52	54	
Difference from average %.	+1				5									23	+4				-2	-10			0	-4		+0	+1	+11	+11			+2		
Maximum percentage in one day .....	81	92		92	83		92	92	89	98	93	91	80	90	90	95	92	90	84	92	96	79	93	80	80	93	93	92	90	84	92	94	94	
Date of maximum .....	21	9		26	25		27	17	17	18	12	18	26	13	12	11	27	10	31	16	19	13	17	9	14	29	43	13	12	5	21	12	18	
No. of days completely clouded.....	2	3		4	7		4	2	2	2	3	1	3	0	1	1	0	0	1	3	0	3	2	0	0		1	7	0	0	1	1	4	6

*Aurora recorded:—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

2. Aweme II, Aitkensville III, Waitefield IV.
3. Sion, Haileybury III, Glenbryan I, Muenster I, Waseca,
4. Aitkensville IV.
5. Crescent Lake III, Muenster II.
6. Muenster,
12. Aitkensville IV, Oliver.
13. Sion,
14. Esterhazy IV.
15. Threehills Creek IV, Halkirk
16. Aweme IV, Aitkensville IV, Schreiber, Threehills Creek III, Gravenhurst IV, Haileybury III, Quebec IV, Lake Talon IV.
17. Haileybury IV.
18. Kenora IV, Sion, Dawson IV, Crescent Lake IV.
19. Hillview IV, Treherne III, Aweme II, Aitkensville III, Kenora III, Fredericton I, Haileybury IV, Dawson IV, Esterhazy IV, Lake Talon.
20. Bruce Mines IV, Sion, Haileybury IV, Glenbryan I.
21. Sion, Waitefield III, Gravenhurst IV.
22. Cartwright III, Aitkensville IV, Waitefield III, Bruederheim, Haileybury IV, Dawson IV, Glenbryan II, Yellow Grass, Oliver, Esterhazy III, Sion IV.
23. Georgetown IV, Treherne II, Aweme II, Ninga, Aitkensville II, Bruce Mines I, Clinton I, Haliburton I, Kenora II, Kakabeka Falls II, Oliver, Esterhazy IV, Chilliwack III, New Westminster, Salmon Arm, Lucknow IV, Madoc III, Montague, Schreiber, Cape Magdalen, Peace River Crossing, Sion III, Waitefield II, Gravenhurst III, Haileybury II, Parry Sound III, Southampton III, Toronto, IV, Father Point III, Quebec III, Winnipeg II, Dawson IV, Glenbryan II, Yellow Grass, Crescent Lake II, Barrie III, Lake Talon.
24. Cartwright, Aweme III, Aitkensville IV, Agincourt II, Birnam III, Kenora IV, Matheson III, Harmattan IV, Sion, Halkirk, Haileybury IV, Ottawa II, Port Arthur I, Cannington Manor, Esterhazy IV.
25. Aitkensville IV, Kenora IV, Kakabeka Falls IV, Dawson IV, Crescent Lake IV, Esterhazy IV.
26. Aweme III, Threehills Creek III, Sion II, Waitefield III.
27. Aweme II, Pakan IV, Waitefield IV, Crescent Lake IV.
28. Aitkensville III, Esterhazy III, Fort Vermilion III.
29. Threehills Creek, III, Sion,
30. Aweme III, Lucknow IV, Threehills Creek III, Sion III, Waitefield II, Haileybury III, Glenbryan II, Oliver, Quill Lake, Fort Vermilion IV.
31. Lucknow IV, Chicoutimi, Sion IV, Quebec IV, Waseca, Fort Vermilion III.

*Thunder recorded :*

1. Rapid City, Georgetown, Emsdale, Deer Park, Brantford, Bruce Mines, Haliburton, Midland, Montreal River, Uplands, Fruitvale, Threehills Creek, Alix, Hillsdown, Sion, Halkirk, Red Deer, Waitefield, Dunstable, Toronto, White River, Cannington Manor, Enderby, Hope, Princeton, Quesnel, Salmon Arm, Summerland, Grand Forks, Amis, Fort St. James, Lake Talon.
2. Georgetown, Emsdale, Westport, Treherne, Aweme, Almasippi, Beatrice, Haliburton, Lucknow, Madoc, Paris, Stony Creek, Uplands, Chicoutimi, Chicoutimi East, Sion, Waitefield, Gravenhurst, Port Stanley, Toronto, Pemberton Hatchery, Princeton, Grand Forks, Chilcote, Barrie, Lake Talon.
3. Norquay, Georgetown, Haliburton, Lucknow, Madoc, Renfrew, Point Clark, Chicoutimi, Lake Edward, Waitefield, Melfort, Nelson, Alberni, Hope, Princeton, Grand Forks, Berens River, Chilcote, Lost River, Barrie.
4. Lucknow, Uplands, Harmattan, Loveland, Gravenhurst, Ottawa, Southampton, Chilliwack Hope, North Nicomen, Grand Forks, Lost River, Lake Talon.
5. Westport, Aurora, Madoc, Peterboro, Renfrew, Waitefield, Princeton, Rossland, Tobacco Plains, Lakefield, Lost River.
6. Georgetown, Westport, Wesley, Morden, Almasippi, Agincourt, Brantford, Haliburton, Madoc, Montague, Paris, Renfrew, Lake Edward, Shawinigan Falls, Lindsay, Montreal, Quebec, Bella Coola, Alton, Clarke City.



7. Emsdale, Westport, Aweme, Birnam, Brantford, Bruce Mines, Kenora, Lucknow, Paris, Schreiber, Stony Creek, Chicoutimi, Sherbrooke, Haileybury, Port Stanley, Southampton, Toronto, Chatham, N. B., Glenbryan, Divide, Yellow Grass, Chaplin, Cannington Manor, Rossland, Lakefield, Clarke City.

8. Emsdale, Westport, Deer Park, Perkins Mills, Agincourt, Kakabeka Falls, Madoc, Montague, Montreal River, Peterboro, Providence Bay, Renfrew, Uplands, Chicoutimi East, Lake Edward, Shawinigan Falls, Waitefield, Lindsay, Gravenhurst, Ottawa, Parry Sound, Toronto, Montreal, Quebec, Kingston, Salmon Arm, Lakefield, Barrie, Lake Talon.

9. Bruce Mines, Kenora, Kakabeka Falls, Lucknow, Providence Bay, Chicoutimi, Waitefield, Southampton, White River, Timiskaming, Quinze Dam.

10. Georgetown, Dutton, Birnam, Lucknow, Madoc, North Gower, Peterboro, Point Clark, Paken, Loveland, Sion, Waitefield, Dunstable, Muenster, Alberni, Chilliwack, Hope, New Westminster, North Nicomen, Princeton, Chilcote, Campsie.

11. Princeton, Paris, Peterboro, Stony Creek, Lake Edward, Gleichen, Threehills Creek, Sion, Lindsay, London, Port Stanley, Toronto, Glenbryan, Enderby, Hope, Salmon Arm, Wilmer, Lost River.

12. Cartwright, Gretna, Treherne, Morden, Aweme, Almasippi, Kenora, Athabasca Landing, Sion, Dunstable, Divide, Crescent Lake, Massett, Shawnigan Lake, Campsie, Clarke City.

13. Treherne, Oakbank, Montreal River, Matheson, Chicoutimi East, Threehills Creek, Alix, Hillsdown, Loveland, Halkirk, Red Deer, Waitefield, Haileybury, Last Mountain, Glenbryan, Divide, Yellow Grass, Crescent Lake, Chaplin, Cannington Manor, Saskatoon, Lost River.

14. Norquay, Dutton, Ninga, Kakabeka Falls, Schreiber, Brome, Lake Edward, Threehills Creek, Harmattan, Loveland, Sion, Halkirk, Dunstable, Quebec, Quinze Dam, Crescent Lake, Chaplin, Esterhazy.

15. Rapid City, Norquay, Gretna, Emsdale, Westport, Princeton, Kentville, Almasippi, Ninga, Agincourt, Birnam, Brantford, Madoc, Montague, Paris, Renfrew, Uplands, Fredericton, Brome, Sherbrooke, Moncton, Harmattan, Pekisko, Dunstable, Haileybury, London, Ottawa, Port Stanley, White River, Montreal, St. John, N.B., Chatham, N.B., Cannington Manor, Annis, Berens River.

16. Georgetown, Emsdale, Westport, Perkins Mills, Birnam, Brantford, Clinton, Haliburton, Lucknow, Madoc, Montague, Montreal River, Matheson, Paris, Point Clark, Sherbrooke, Point Lepreaux, Threehills Creek, Haileybury, London, Port Stanley, Southampton, Toronto, White River, Kingston, Yarmouth, Glenbryan, Chaplin, Rathmullen, Lost River, Lake Talon.

17. Georgetown, Westport, Agincourt, Lucknow, Matheson, Point Clark, Harmattan, Haileybury, Toronto, Montreal, Lake Talon.

18. Georgetown, Emsdale, Westport, Hillview, Treherne, Morden, Almasippi, Aitkensville, Agincourt, Beatrice, Aurora, Birnam, Haliburton, Madoc, Brome, Chicoutimi, Lake Edward, Sherbrook, Pt. Lepreaux, Sion, Lunnford, Red Deer, Dunstable, Gravenhurst, Haileybury, Minnedosa, Parry Sound, Toronto, Quebec, Kingston, Cannington Manor, Campsie, Lakefield, Barrie, Hamilton.

19. Kentville, Ninga, Fredericton, Brome, Pt. Lepreaux, St. Stephen, Gleichen, Threehills Creek, Athabasca Landing, Hillsdown, Blairmore, Loveland, Sion, Halkirk, Waitefield, Pekisko, Dunstable, Minnedosa, Montreal, Grand Manan, Charlottetown, Yarmouth, Muenster, Oliver, Prince, Golden, Rossland, Salmon Arm, Wilmer, Annis, Chilcote, Campsie, Lost River, Alkali Lake.

20. Cartwright, Rapid City, Brandon, Hillview, Treherne, Aweme, Almasippi, Aitkensville, Harmattan, Bittern Lake, Brudeheim, Last Mountain, Rosthern, Cannington Manor, Muenster, Prince, Rathmullen, Esterhazy, Berens River, Lost River.

21. Norquay, Morden, Schreiber, Threehills Creek, Waitefield, Loch Sloy, Winnipeg.

22. Cowichan, Chilliwack, Hope, New Westminster, North Nicomen, Princeton, Salmon Arm.

23. Toronto, Nicola, Shawnigan Lake.

24. Westport, Loveland, Sion, Waitefield, Chaplin.

25. Threehills Creek, Hillsdown, Loveland, Sion, Halkirk, Waitefield, Dunstable, Tobacco Plains.

26. Salmon Arm.

27. Georgetown, Westport, Deer Park, Perkins Mills, Agincourt, Beatrice, Haliburton, Madoc, Renfrew, Schreiber, Dunstable, Gravenhurst, London, Toronto, Kingston, Lakefield, Barrie.

28. Georgetown, Westminster, Princeton, Haliburton, North Gower, Providence Bay, Chicoutimi, Lake Edward, Sion, Red Deer, Dunstable, Haileybury, Father Point, Montreal, Campsie, Clarke City.

29. Fredericton, Threehills Creek, Loveland, Sion, Bardo, Dunstable, Lost River.

30. Rapid City, Gretna, Morden, Sion, Waitefield, Dunstable, Caldwell, Crescent Lake, Lost River.

31. Cartwright, Morden, Aweme, Schreiber, Blairmore, Sion, Halkirk, Red Deer, Dunstable, Gravenhurst, Winnipeg, Last Mountain, Rathmullen, Esterhazy.

## FORECASTS FOR AUGUST, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1328. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta.....	83	61	12	7	81.3
Saskatchewan.....	82	65	10	7	85.4
Manitoba.....	81	71	4	6	90.5
Lake Superior.....	115	92	18	5	87.8
Georgian Bay.....	129	111	13	2	93.1
Ottawa Valley.....	104	83	17	4	88.0
Upper St. Lawrence.....	104	83	17	4	88.0
Lower Lake Region ..	129	111	14	4	91.5
Lower St. Lawrence.....	120	92	18	10	84.2
Gulf.....	121	94	26	1	86.3
Maritime Provinces West.....	127	103	12	12	85.8
Maritime Provinces East.....	127	103	10	14	85.0
Total.....	1328	1078	171	79	87.6

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto.

September 26, 1911.





# DEPARTMENT OF MARINE AND FISHERIES, CANADA.

## METEOROLOGICAL SERVICE.

# Monthly Weather Review.

VOL. XXXV.

SEPTEMBER, 1911.

No. 9.

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### GENERAL SYNOPSIS.

The mean temperature of the month in British Columbia closely approximated to the average of the preceding twenty-five years, falling for the most part less than  $1^{\circ}$  below. In the Queen Charlotte Islands there appeared to be an excess of  $2^{\circ}$  over the average. In the valley of the lower Fraser rain fell on 12 or 13 days, and the amount was generally a little in excess of normal. Elsewhere in the province, except on Vancouver Island, there was a general deficiency of precipitation. Sharp frost occurred in the Kootenays and Okanagan Valley about the 24th and 25th.

The mean temperatures were between  $2^{\circ}$  and  $3^{\circ}$  less than normal in the southern portion of Alberta, but at Edmonton were nearly average. During the first week maximum temperatures exceeded  $80^{\circ}$  in the southern districts, while in the north  $75^{\circ}$  was not reached;  $8^{\circ}$  to  $12^{\circ}$  of frost occurred at the beginning of the last week over the greater part of the southern and central portions of the province, and a temperature of  $9^{\circ}$  was recorded at Athabasca Landing on the 24th. Precipitation appeared to be in excess of the normal in the south but somewhat deficient in the more northerly districts.

In Saskatchewan the difference from normal September temperature was about  $2^{\circ}$ . At Prince Albert, however, there was a deficiency of  $1^{\circ}$ , and at Qu'Appelle the month was  $3^{\circ}$  cooler than normal. As in Alberta, sharp frosts occurred during the last week, but were not so severe in the northern portion. About two-thirds of the usual rainfall was recorded. Weather conditions were much the same in Manitoba as in the Prairie Provinces, as regards temperature, but the precipitation was well in excess of normal.

Temperatures in the peninsula of Ontario were nearly normal, but in other parts of the province were  $2^{\circ}$  to  $3^{\circ}$  below. The month began with temperatures ranging between  $85^{\circ}$  and  $90^{\circ}$  but ended with frost, which was severe in Algoma, but in the Ottawa Valley did not exceed  $7^{\circ}$  and in the southern counties was not of general occurrence. Precipitation was heavy in some of the southern counties, and while a little less than normal in many other parts of the province there was no marked deficiency except on the eastern shore of the Georgian Bay.

In Quebec the majority of observers reported less than the average precipitation and the mean temperatures from  $1^{\circ}$  to  $2^{\circ}$  below normal.

In Nova Scotia nearly twice the normal rain-fall was recorded, while in the remainder of the Maritime Provinces, the precipitation although not so heavy was generally well above average. Temperatures were  $2^{\circ}$  lower than the twenty-five year average, except in southern Nova Scotia, where the deficiency was but  $1^{\circ}$ .

### ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for September exceeded the average throughout the greater part of Canada, the greatest positive departures occurring in Northern Saskatchewan and Northern Alberta. In Central British Columbia, however, the mean pressure for the month was somewhat below normal.

The range of difference from normal throughout Canada was 0.18 of an inch, the extremes being +.11 of an inch at Prince Albert, Sask. and -.07 of an inch at Kamloops, B.C.

## LOW AREAS.

The paths of fourteen areas of low pressure were sufficiently well defined to be charted. One first appeared in the Yukon Territory, four in Northern British Columbia, two in the Western Provinces, one in the North Pacific States, one in the South Pacific States, three in the Western States, one to the southward of the Maritime Provinces and one in Northern Quebec.

The general track of the areas was over or to the northward of the Great Lakes, thence to the Straits of Belle Isle and Newfoundland. A few only were energetic, the most pronounced being the area which appears to have formed in the vicinity of Kansas on the 27th, whence it travelled over the southern portion of the Lower Lake Region with increasing intensity, becoming a pronounced storm as it passed along the Nova Scotian coast and over Newfoundland.

## HIGH AREAS.

Ten areas of high pressure were charted for the month, which is a larger number than usually occur in September. Three first appeared in the Yukon Territory; three on the northern boundary of the Western Provinces; three on the coast line of the North Pacific States and one to the northward of Lake Superior. The general track of the areas was over the Great Lakes, thence either southeasterly off the New England coast or else over the Maritime Provinces and Newfoundland. They were for the most part well pronounced systems for so early in the autumn season and attended by much cool weather, also in more northern districts by sharp night frosts on several occasions.

## TEMPERATURE.

The mean temperature of September, 1911, was lower than the average of the preceding twenty-five years over the whole of the Dominion, except at a few points in British Columbia and Ontario, where the average was barely equalled.

*The highest and lowest temperatures recorded in each Province during the month of September, 1911, were:*

	HIGHEST.	LOWEST.
British Columbia, .....	94° at Crawford Bay on the 2nd.	16° at Fort St. James on the 22nd.
Alberta, .....	87° at Cardston on the 7th.	9° at Athabasca Landing on the 24th.
Saskatchewan, .....	88° at Glenbryan on the 1st.	14° at Muenster on the 23rd.
Manitoba, .....	82° at Aweme on the 3rd.	19° at Cypress River on the 30th.
Ontario, .....	91° at Chatham on the 1st & 2nd.	14° at White River on the 28th.
Quebec, .....	85° at Shawinigan Falls on the 10th.	23° at Lake Edward on the 29th.
New Brunswick, .....	84° at Grand Manan on the 4th.	23° at St. Stephen on the 29th.
Nova Scotia, .....	87° at Antigonish on the 9th.	28° at Antigonish on the 15th and at Windsor on the 29th.
P. E. Island, .....	75° at Charlottetown on the 2nd.	32° at Charlottetown (2) on the 29th.

## PRECIPITATION.

In Quebec, northern Alberta and parts of British Columbia and Ontario, there was a deficiency of rain, but elsewhere in the Dominion it was plentiful, while in Nova Scotia it was excessive.

## WINDS, SEPTEMBER, 1911.

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of days of Gales	Number of days of Strong Winds.	Number of days of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Vietoria .....	4395	261	30	1	1	13	SW.
Steveston .....	6116	418	26	.....	8	12	SW.
Triangle Island .....	5177	485	58	3	.....	.....	SW.
ALBERTA.							
Edmonton .....	3998	266	19	.....	2	5	W.
SASKATCHEWAN.							
Battleford .....	6363	397	30	1	7	9	NW.
Prince Albert .....	4004	268	18	.....	1	5	N.
Swift Current .....	7043	431	32	1	6	11	N., NW.
MANITOBA.							
Winnipeg .....	7625	414	30	1	10	14	W.
ONTARIO.							
Port Arthur .....	6748	490	35	2	7	8	N., NW.
Southampton .....	5199	345	26	.....	3	13	N.
Woodstock .....	4742	269	23	.....	3	12	NW.
Toronto .....	7755	523	32	2	8	6	NW.
QUEBEC.							
Quebec .....	7522	675	33	2	9	11	NE.
Father Point .....	8151	482	29	.....	19	5	W.
Anticosti, SW. Pt. ....	10358	884	42	9	10	5	NW.
MARITIME PROVINCES.							
Fredericton .....	4877	327	21	.....	1	12	NE.
St. John .....	7965	466	33	3	9	12	NW.
Pt. Lepreaux .....	9697	586	51	6	11	11	W.
Halifax .....	7983	601	36	4	7	12	NE.
Flat Point .....	11546	1171	69	9	14	4	SW., NW.
Charlottetown .....	6074	414	29	.....	4	8	SW.



[illegible]





a Barometer not reduced to Sea Level. \* Stations not furnished with Registering Thermometers.

[illegible]





$\alpha$  Harometer not reduced to Sea Level.

\* Stations not furnished with registering thermometers.

[illegible]

## NOVA SCOTIA—

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## P. E. ISLAND—

Charlottetown.....	46	11	63	10	38	30	02	30	38	25	58	0	81	55	8	1	9	36	75	0	2	31	5	15	12	9	—	6	24	2	30	1	22	18	12	0	2	1
Charlottetown (2).....	46	11	63	7	75	—	—	—	—	—	—	—	—	55	3	—	2	73	0	2	11	32	0	23	14	7	—	6	26	1	11	21	9	0	0	0	0	
Hamilton.....	16	25	63	48	—	—	—	—	—	—	—	—	—	55	0	—	11	70	0	1	42	36	0	13	13	3	—	2	10	1	01	0	77	7	24	0	0	0

NEWFOUNDLAND—

Annoor Point.....	51	28	56	51	27	30	01	30	43	29	29	1	14	53	1	—	3	68	0	22	33	0	16	18	2	—	2	1	60	1	40	17	1	1	2	1	
Barin.....	17	0	55	10	—	—	—	—	—	—	—	—	—	48	2	—	23	60	0	6	38	0	30	9	9	—	1	1	0	90	0	90	10	21	3	0	5
Cape Norman.....	51	38	55	52	30	29	46	30	40	29	43	0	97	52	2	—	2	65	0	19	41	0	10	9	9	—	1	7	3	14	10	4	56	0	0	0	
Fogo.....	49	13	51	17	35	29	46	30	40	29	43	0	97	52	2	—	2	65	0	19	41	0	10	9	9	—	1	7	3	14	10	4	56	0	0	0	
Point Rich.....	50	42	57	25	35	29	46	30	40	29	43	0	97	52	2	—	2	65	0	19	41	0	10	9	9	—	1	7	3	14	10	4	56	0	0	0	
Port aux Basques.....	27	25	59	10	—	—	—	—	—	—	—	—	—	51	2	—	3	63	5	21	34	0	15	10	4	—	1	6	4	18	8	1	60	0	1	0	
St. John's.....	47	31	52	42	125	25	42	30	35	29	41	0	91	54	7	+	1	0	39	74	0	20	36	0	13	1	—	11	12	+	37	1	17	18	12	0	4

BERMUDA—

Prospect.....	32	17	61	16	151	30	11	30	31	29	65	0	66	77	2	—	0	621	86	8	10	65	1	28	11	3	—	1	6	2	9	11	15	4	5	4	40
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## NEWFOUNDLAND—

Anmour Point.....	51	28	56	51	27	30	01	30	43	29	29	1	14	53	1	—	3	68	0	22	33	0	16	18	2	—	9	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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## BERMUDA—

Prospect.....	32	17	61	66	151	30	11	30	31	29	65	0	66	77	2	—	0	62	1	86	8	10	65	1	28	11	3	—	2	94	2	30	1	62	11	19	0	5	0
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## PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &amp;c., DURING SEPTEMBER, 1911.

STATIONS.	RAINFALL.				SNOWFALL.				REMARKS.
	Amount in inches.	No. of Days of or over	No. of Heavy Fair Days	No. of Heavy Fall In Month	Date.	Date.	The first Fall in Month	No. of Days.	
BRITISH COLUMBIA—									
Alkali Lake.	2.69	10	2	1.26	26				
Amis.	1.89	12	18	0.80	13				
Beaver Lake.	2.03	10	20	0.45	12				
Cocultham.	7.40	9	21	1.78	11				
Denman's Island.	2.62	10	20	0.84	14				
Ferguson.	2.97	8	22	0.61	3				
Goldstream Lake.	2.66	14	16	0.69	15				
Hydraulic.	2.07	12	18	0.46	27				
Hornby Island.	2.20	8	22	0.75	14				
Jordan River.	4.52	14	16	1.33	15				
Jordan River (Bear Creek).	5.59	13	1	1.20	11				
Little Qualicum (French Creek, V.I.)	2.05	5	25	0.75	18				
Monte Creek.	1.29	7	22	0.60	1				
Nuas Harbour.	3.61	11	19	0.18	17				
Skidegate.									
Shawnigan Lake.	1.74	11	16	0.52	15				
ALBERTA—									
Bardo.	0.10	1	29	0.14	15				1/2 ice on 22nd.
Bismark.	2.04	4	25	0.50	16	2.0	1	2.0	21
Bruderheim.	1.05	5	24	0.78	15				
Bittern Lake.	0.46	6	24	0.18	16				
Brooks.	0.55	6	23	0.57	17	1.5	1	1.5	23
Conjuring Creek.									
Coutts.									
Campsio.	1.48	6	23	1.11	15		1		23
Caldwell.	6.62	9	24	2.19	3	4.0	1	4.0	5
Dorence.	1.35	4	26	0.80	18				
Dunstable.	1.75	12	18	1.10	16				
Grassy Lake.	1.40	6	23	0.40	6	1.0	1	1.0	22
Jumping Pound.									
Lacombe.									
Loch Sloy.	1.85	10	19	0.81	4	4.0	1	1	22
Lyndon.	5.77	4	26	2.84	6				
Lineham.	0.30	1	17	0.30	6	1.8	2	1.5	21
Macleod.	0.59	6	22	1.66	4	4.5	2	2.0	5.23
Milda (Many Berries R.)									
Mayeroff.	2.41	8	20	1.29	1	7.0	2	5.5	22
Nateby.	0.67	3	26	0.31	2	0.4	2	0.1	22
Okotoks.	1.22	5	24	0.46	1	7.0	1	7.0	23
Pekisko.	1.07	7	20	1.60	3	9.8	3	5.5	22
Ponoka.	2.53	6	23	2.10	18	1.0	1	1.0	19
Priddis.									
Playle Creek.	1.57	6	22	2.37	4		2		5.6
Sion.	1.95	10	24	6.12	15				
Seven Persons.	1.45	5	25	2.80	5				
Tilley.									
SASKATCHEWAN—									
Carmichael.									
Coule.									
Elm How.									
Forks Swift Current. (Gull Lake)	3.14	6	23	1.30	4	3.5	1	3.5	22
Gull Lake.	1.74	4	25	0.92	5	6.0	1	6.0	23
Gravelbourg.	2.27	4	26	1.57	4				
Hanley.									
Kindersley.									
Last Mountain.	0.88	7	23	0.45	16-19				
Maple Creek.	2.61	11	18	0.79	4	3.0	1	3.0	21
Meadow Lake.	1.16	3	27	0.62	27		2		21.23
Willow Creek.	4.09	5	25	3.13	7				
MANITOBA—									
Cartwright.	2.53	9	21	0.67	28				
Deloraine.									
Gretna.	1.18	5	25	0.16	28				
Norquay.	2.24	10	20	0.47	25		2		26.27
Rapid City.	1.09	6	23	0.56	28		1		23
Rosebank.									
ONTARIO—									
Deer Park.	2.35	10	20	0.51	29				
Dutton.	2.30	7	23	0.80	28				
Emisdale.	1.79	9	21	0.13	25				
Georgetown.	3.76	14	16	0.79	29				
Grantham.	2.07	12	18	0.44	6				
Grand Valley.	4.62	11	19	0.98	3				
MacCue.	2.30	8	22	0.56	11				
Orangeville.	3.62	8	22	1.05	2				
Princeton.	2.50	8	22	0.52	29				
Sydenham.	2.05	5	25	0.85	5				
Strathroy.	2.50	7	23	1.19	29				
Watford.	3.11	11	19	0.91	29				
Westport.	1.85	7	23	0.71	6				
Wooler.	2.41	9	21	0.45	11				
Westminster.	2.62	5	24	1.01	11				
Wesley.	4.16	10	20	0.98	12				
QUEBEC—									
Kepawa.									
Lacorne.	2.40	8	22	0.75	21				
Perkins Mills.	2.50	9	21	0.71	15				
Quinze Dam.									
Timiskaming.	1.61	9	21	0.54	11	1.0	1	1.0	20
NEW BRUNSWICK—									
Point Escominae.	1.86	9	21	0.53	26				
NOVA SCOTIA—									
Kentville.	1.91	10	20	1.72	20				
Kedgemaquoog Lake (New Grafton).	5.41	8	22	1.92	20				
Liverpool.	5.28	9	21	1.12	4				
Milton (Rapid Falls Mill).	5.84	9	21	1.45	1				
South Alton.	6.19	12	18	2.22	20				
White Rock.	5.21	9	21	1.86	20				

MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
SEPTEMBER, 1911.

STATIONS.	HOURS ENDING															
	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	
Victoria .....		01	07	36	42	52	56	58	58	55	51	48	45	47		
Salmon Arm .....			13	37	46	56	66	57	65	48	45	41	31	41		
Nanaimo.....																
Vancouver.....			06	18	30	48	48	49	52	58	53	56	41	44	03	
Agassiz.....			04	20	45	46	43	45	51	45	47	31	16	01		
Tranquille .....		03	25	39	51	61	57	60	60	58	58	50	36	19	03	
Summerland.....		09	27	46	55	52	52	57	52	48	51	39	07			
Kamloops.....		01	22	44	53	60	68	65	61	58	66	51	36	06	01	
Edmonton.....		02	22	43	68	73	75	74	68	70	66	53	41	22	01	
Lethbridge.....		04	38	56	63	64	67	68	70	68	62	58	55	36	02	
Lacombe.....			08	42	59	65	70	70	71	59	57	47	48	19		
Medicine Hat .....			17	48	54	58	65	68	71	68	59	40	29	11		
Fort Vermilion.....				04	23	37	53	67	67	61	64	62	54	46	15	
Battleford .....			05	24	39	45	55	57	53	48	48	48	36	11		
Indian Head.....		02	15	34	54	52	52	59	58	54	53	49	33	12	01	
Moosejaw.....		02	15	41	50	57	52	57	58	57	63	58	47	14	03	
Scott.....		01	07	39	51	49	56	57	65	66	62	63	48	07	02	
Rosthern.....			14	51	52	54	59	70	76	68	63	63	59	24		
Brandon.....			07	33	54	57	62	57	61	56	57	46	21	07	02	
Winnipeg.....			10	40	49	43	40	38	49	53	55	49	45	18		
Haileybury.....		02	34	50	55	55	69	69	70	73	67	60	55	38	03	
Gravenhurst.....																
Woodstock .....			01	25	57	64	59	66	60	59	55	54	42	10		
Lindsay.....				10	51	62	63	66	67	65	63	52	47	33		
Barrie.....			21	56	58	61	58	63	59	56	56	56	51	21		
Toronto.....			13	55	65	68	66	67	64	68	67	62	56	34	01	
Kingston .....	01	05	20	44	55	63	69	73	70	65	62	60	51	19	02	
Ottawa.....			22	52	59	68	70	66	70	65	71	61	59	34		
Montreal.....		04	31	60	65	70	70	66	63	65	65	54	60	19		
Quebec.....			09	31	44	43	52	51	57	53	55	52	53	08		
Sherbrooke.....			13	33	47	50	55	54	58	58	58	56	58	40		
Fredericton.....		01	17	43	48	48	55	54	54	53	46	48	41	20	4	
Charlottetown.....		04	26	47	56	54	51	49	51	53	49	47	39	21	02	

	Victoria.	Salmon Arm.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Ft. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Scott.	Rosthern.	Brandon.	Winnipeg.	Haileybury.	Gravenhurst.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Fredericton.	Charlottetown.
Registered duration in hours.	158	155	..	141	149	175	164	178	204	213	186	176	166	140	159	173	172	194	155	146	210	..	165	171	185	196	198	210	211	151	173	157	165
Percentage of possible duration %.....	42	41	..	37	32	46	43	47	51	57	49	47	43	37	42	46	45	51	41	39	56	..	44	47	49	55	53	56	61	41	46	42	44
Difference from average %.....	-3	..	..	..	+1	..	..	..	..	..	..	..	..	-8	+3	..	..	..	-5	-7	..	..	5	5	+1	+0	+2	+12	+8	..	..	+1	
Maximum percentage in one day %.....	88	88	..	90	73	97	91	90	89	95	86	84	80	79	93	96	84	88	89	90	98	..	86	81	89	92	95	93	100	83	99	96	98
Date of maximum .....	17	11	..	1	11	11	11	19	7	25	2	1	5	8	2	2	1	12	2	2	13	..	3	13	17	3	3	13	3	11	18	4	2
No. of days completely clouded. ....	5	5	..	5	12	6	2	2	2	4	2	5	3	2	..	5	4	3	5	9	2	..	5	1	2	1	0	5	4	5	8	5	8

*Aurora recorded:—*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Treherne III, Waitefield III, Aitkensville IV, Sion, Glenbryan I.
2. Aitkensville IV, Sion, Fort Vermilion IV.
3. Red Deer I, Sion.
4. Red Deer I, Aitkensville IV, Sion, Campsie IV, Muenster IV, Cape Norman I, Fort Vermilion II.
5. Red Deer I, Sion.
6. Red Deer I, Aitkensville IV, Sion, Fort Vermilion II.
7. Sion, Gravenhurst IV.
8. Sion.
10. Sion, Glenbryan, Grand Manan IV.
11. Aitkensville III, Sion.
12. Chicoutimi, Sion, Campsie IV, Muenster IV.
13. Haileybury IV.
14. Aweme II, Kakabeka Falls III, Sion III, Quebec IV, Cape Norman II.
15. Fmsdale II, Hillyjiew I, Treherne IV, Aweme III, Aitkensville III, Crescent Lake III, Divide III, Yellow Grass, Dawson II, Haileybury IV, Cape Norman II, Barrie IV, Kenora I.
16. Lake Talon IV, Yarbo III.
18. Sion IV, Fort Vermilion IV.
19. Cartwright III, Georgetown IV, Hillview I, Aweme II, Oakbank III, Halkirk, Agincourt IV, Kakabeka Falls III, Bruce Mines, Lucknow IV, Clinton, I, Red Deer I, Hillsdown, IV, Aitkensville II, Sion IV, Lake Talon, Crescent Lake II, Estevan III, Summerland, Nicola, Cranbrook, Port Stanley III, Dawson IV, Haileybury II, Delia III, Barrie III.
20. Treherne IV, Agincourt III, Birnam IV, Cape Magdalene, Yarbo IV, Minnedosa I, Dawson II, Haileybury III, Fort Vermilion III.
21. Cartwright IV, Treherne I, Waitefield III, Agincourt IV, Kakabeka Falls III, Lucknow IV, Birnam IV, Sion II, Campsie IV, Dawson I, Fort Vermilion I, Fort St. James.
22. Chicoutimi, Sion III, Lake Talon, Waseca, Quebec IV, Father Point III, Fort Vermilion I.
23. Treherne II, Lake Talon IV.
25. Waitefield IV, Renfrew, Sion, Melfort.
26. Hillview IV, Aweme IV, Chicoutimi, Yarbo III, Divide IV, Father Point III, Haileybury III, Gravenhurst IV.
27. Kakabeka Falls IV, Crescent Lake III, Divide IV, Fort Vermilion IV.
28. Sion IV, Chaplin IV, Quebec IV, Fort Vermilion II, Oliver.
29. Waitefield IV.
30. Waitefield IV, Sion IV, Fort Vermilion III.

*Thunder recorded :*

1. Hillview, Agincourt, Lost River, Princeton, Uplands.
2. Wesley, Westport, Princeton, Georgetown, Deer Park, Wooler, Point Clark, Paris, Lucknow, Madoc, Chicoutimi, London, Gravenhurst, Lindsay, Chicoutimi West, Shawinigan Falls, Disraeli, Lake Edward, Tobacco Plains, Summerland, North Nicomen, Chilliwack, Chilcoten, Parry Sound, Minnedosa, Quebec, Chatham, N.B., Port Arthur, Ottawa, Port Stanley, Southampton, Montreal, Toronto, Hope.
3. Aweme, Windsor, N.S., Harmattan, Crescent Lake, Chaplin, Divide, Pense, Glenbryan, Rathmullen, Yellow Grass, Kelvindhurst, Hydraulic, Annis, Rossland, Grand Forks, Salmon Arm, Nelson, Chilliwack, Fredericton, Charlottetown, St. John, N.B.
4. Chaplin.
5. Bruce Mines, Birnam, Pelee Island, Chilcoten.
6. Hydraulic, Chilcoten, Bella Cooka.
7. Chilcoten.
8. Dunstable, Campsie, Chilcoten.
9. Gravenhurst.
10. Halkirk, Grand Forks, Salmon Arm, New Westminster, Chilliwack, Quebec, Montreal, Hope.
11. Wesley, Em-dale, Georgetown, Deer Park, Wooler, Point Clark, Morden, Beatrice, Agincourt, Renfrew, Paris, Bruce Mines, Aurora, Lucknow, Peterboro', Madoc, Clinton, Birnam, Brantford, Bloomfield, Pelee Island, Montague, Moncton, Lake Talon, Steveston, North Nicomen, New Westminster, Chilliwack, Southampton, Toronto, Gravenhurst, Lindsay, Uplands, Hope.
12. Westport, Princeton, Treherne, Morden, Brome, Disraeli, Point Lepreaux, Windsor, N.S., Owen Sound, Annis, Crawford Bay, Rossland, Summerland, Steveston, Salmon Arm, Princeton, North Nicomen, Nicola, Golden, Chilliwack, Chilcoten, Alberni, Fredericton, Charlottetown, St. John, N.B., Ottawa, Port Stanley, London, Hope.
13. Westport, Athabasca Landing, Waitefield, Caldwell, Dunstable, Campsie, Chaplin, Divide, Scott, Glenbryan, Fort Vermilion.



14. Rapid City, Point Clark, Carberry, Paris, Lucknow, Birnam, Crescent Lake, Chilliwaek.
15. Princeton, Georgetown, Waitefield, Agincourt, Brantford, Bardo, Pagan, Crescent Lake, Chaplin, Pense, Lost River, Crawford Bay, Clayoquot, Alberni, Port Stanley, Toronto, Bruederheim.
16. Oakbank, Renfrew, Montague, Brome, Shawinigan Falls, Yarbo, Salmon Arm, Montreal.
17. Gretna, Almasippi.
18. Kakabeka Falls.
19. Emsdale, Princeton, Georgetown, Almasippi, Paris, Harmattan, Okotoks, Dunstable, Chaplin.
20. Hillview, Harmattan, Crescent Lake, Prince, Sydney.
21. Alberni, Bella Coola.
22. Kakabeka Falls, Port Arthur.
24. Lucknow.
25. Agincourt, Toronto.
26. Yarmouth.
27. Renfrew, Birnam, Pelee Island.
28. Dunstable, Hydraulic.
29. Dunstable, Last Mountain, Crescent Lake, Chaplin, Lost River, Muenster, Hydraulic, Annis, Crawford Bay, Salmon Arm, Nelson, Enderby.
30. Yarbo.

### FORECASTS FOR SEPTEMBER, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1264. These were divided as follows:—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Per- centage.
Alberta.....	78	60	16	2	87.2
Saskatchewan.....	80	62	14	4	86.3
Manitoba.....	81	60	16	5	83.9
Lake Superior.....	113	61	31	15	71.7
Georgian Bay.....	122	87	30	5	83.6
Ottawa Valley.....	97	73	15	9	83.0
Upper St. Lawrence.....	97	73	15	9	83.0
Lower Lakes.....	122	92	25	5	83.7
Lower St. Lawrence.....	119	88	18	13	81.5
Gulf.....	118	87	25	6	81.3
Maritime Provinces West.....	119	87	25	7	83.6
Maritime Provinces East.....	118	82	20	7	81.8
Total.....	1264	915	262	87	82.8

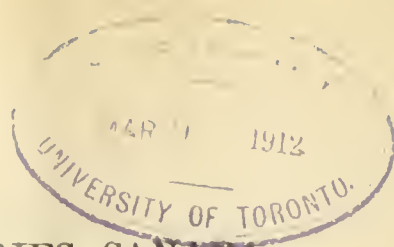
In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto.





# DEPARTMENT OF MARINE AND FISHERIES, CANADA.

## METEOROLOGICAL SERVICE

# Monthly Weather Review.

VOL. XXXV.

OCTOBER, 1911.

No. 10.

### INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

### TEMPERATURE.

The mean temperature of October differed very little from average in the province of British Columbia. On Vancouver Island, the coast-line and the Kootenays and Okanagan Valley the difference was negative, but in most cases did not exceed  $1^{\circ}$ , and, in fact, was generally negligible. Over a portion of the valley of the Lower Fraser and that of the North Columbia the normal temperature was exceeded by less than  $1^{\circ}$ .

At Edmonton there was very little difference from normal October temperature, but elsewhere in Alberta there appeared to be a deficiency of about  $2^{\circ}$ .

In the northern sections of Saskatchewan there was a positive difference from normal, amounting to  $2^{\circ}$  or less, while, nearer the boundary line, negative differences of equal value were reported.

The mean temperature of the province of Manitoba, as a whole, was a little more than  $1^{\circ}$  higher than normal, although there were local exceptions.

Although in New Ontario mean temperatures were in all instances less than average; and in the Ottawa Valley and many of the eastern counties, higher than average: yet these differences were in nearly all cases so small that they may be neglected altogether.

In the counties on the Gulf of the St. Lawrence less than normal temperature was recorded, the difference in most instances amounting to about  $1^{\circ}$ ; but along the river the average was exceeded by  $1^{\circ}$  at Quebec city and by  $2^{\circ}$  at Montreal. In the "Eastern Townships," however, temperature conditions were approximately normal.

Over the greater part of the Maritime Provinces the temperature of the month was from  $1^{\circ}$  to  $2^{\circ}$  lower than average.

*The highest and lowest temperatures recorded in each Province during the month of October, 1911, were:*

HIGHEST.	LOWEST.
British Columbia, ..... $91^{\circ}$ at Crawford Bay on the 7th,	$9^{\circ}$ at Golden on the 28th.
Alberta, ..... $84^{\circ}$ at Cardston on the 9th,	$-3^{\circ}$ at Fort Vermilion on the 31st.
Saskatchewan, ..... $87^{\circ}$ at Chalgoness on the 9th,	$-3^{\circ}$ at Luseland on the 31st.
Manitoba, ..... $85^{\circ}$ at Swan River on the 9th,	$3^{\circ}$ at Swan River on the 31st.
Ontario, ..... $78^{\circ}$ at Lorne Park on the 9th,	$4^{\circ}$ at White River on the 31st.
Quebec, ..... $72^{\circ}$ at La Tuque on the 12th,	$13^{\circ}$ at Lake Edward on the 30th.
New Brunswick, ..... $73^{\circ}$ at St. Stephen on the 11th,	$17^{\circ}$ at St. Stephen on the 30th.
Nova Scotia, ..... $74^{\circ}$ at Antigonish on the 24th,	$16^{\circ}$ at Truro on the 29th.
P. E. Island, ..... $66^{\circ}$ at Charlottetown on the 23rd,	$72^{\circ}$ at Charlottetown (2) on the 29th.



## PRECIPITATION.

Throughout the province of British Columbia there was a deficiency of rain, the difference from average being in many cases very large.

The rainfall in south-western Alberta was very little less than normal, but elsewhere in that province the deficiency was considerably greater.

In the northern portion of Saskatchewan less than the usual amount of rain was recorded, but in the central and eastern districts precipitation was plentiful, as it was in Manitoba also.

In New Ontario there was a moderate deficiency, and also in the Ottawa Valley, but throughout the remainder of Ontario there was an excess of approximately 20.

Except on the Island of Anticosti, there was reported a general lack of rain in the province of Quebec. In most cases the deficiency amounted to one-third of the average and in some instances to one-half.

The precipitation in the Maritime Provinces was very light and almost amounted to a drought in some counties. The differences from average were very large. At some places, indeed, scarcely one-fifth of the normal amount was registered.

## ATMOSPHERIC PRESSURE.

The value of the mean atmospheric pressure for October exceeded the normal throughout Canada. There was a difference from average of over 0.10 of an inch in Alberta and Northern British Columbia, but in other parts of the Dominion the departure was small, being generally about 0.05 of an inch. In parts of Northern Ontario the normal was just exceeded, the difference at White River being only 0.01 of an inch.

## HIGH AREAS.

Nine areas of high pressure were charted; one first appeared in the Yukon Territory, one in Northern British Columbia, one in Northern Saskatchewan, two to the northward of Lake Superior and four on the coasts of the Northern Pacific States. Three of the areas passed over the Great Lakes and two each to the northward and southward respectively, while the two remaining areas were dispersed before reaching the Great Lakes. In nearly all instances the systems were of very moderate energy.

## LOW AREAS.

Fourteen areas of low pressure were charted. Three first appeared in the Yukon Territory, one in Northern British Columbia, one in Northern Saskatchewan, two in the West Pacific States, one in the Western States, two in the Gulf of Mexico, one off the North Carolina coast and one in the Lower St. Lawrence Valley. A few only of the areas were of importance, the majority being of feeble energy, and at least a third of the whole number dispersed after having travelled only a comparatively short distance.

## WINDS, OCTOBER, 1911.

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of days of Gales.	Number of days of Strong Winds.	Number of days of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Victoria.....	3558	290	29	.....	2	6	N.
Steveston.....	1787	328	29	.....	6	8	N. & E.
ALBERTA.							
Edmonton.....	1125	135	23	.....	1	4	N.W.
Calgary.....	1919	339	27	.....	7	6	N.W.
SASKATCHEWAN.							
Battleford.....	6201	572	32	1	8	9	W.
Prince Albert.....	3501	183	13	.....	.....	1	Variable.
MANITOA.							
Winnipeg.....	7711	181	29	.....	11	12	W.
KEEWATIN.							
The Pas.....	5811	395	23	.....	7	7	W.
ONTARIO.							
Port Arthur.....	6945	463	42	3	3	11	NW. & W.
Parry Sound.....	6999	461	27	.....	8	5	SW.
Southampton.....	7424	597	40	1	5	13	S.
Woodstock.....	5688	465	25	.....	6	15	SW.
Toronto.....	9396	700	55	4	8	9	SW. & W.
QUEBEC.							
Quebec.....	8951	602	34	3	9	12	SW.
Father Point.....	11392	822	49	8	13	9	W. & NW.
MARITIME PROVINCES.							
Fredericton.....	5788	414	27	.....	5	14	NW.
St. John.....	8984	605	39	6	10	5	N.W.
Pt. Lepreaux.....	11611	710	42	7	17	5	N.W.
Halifax.....	8246	503	31	2	6	17	N.W.
Flat Point.....	11456	784	52	9	12	4	N. & SW.
Charlottetown.....	6977	373	23	.....	6	12	SW. & NW.







PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, OCTOBER, 1911

parameter not related to sex level.

Stations not furnished with logging thermometers.

[illegible]









## NOVA SCOTIA—

Antigonish	45 38 61 50	50	30 06 30 51 29 81 0 67	45 0	— 1 74 0	24	21 0	20 21 0	10 12 2	6 3	3 6	11 9	3 62	2 03	3 54 0 43	8 23	0 0 0
Halifax	44 39 63 36	88	30 06 30 51 29 81 0 67	46 5	— 2 37 68 2	11	26 5	29 16 1	0 2 0	3 0	14 0	12 0	31	1 20	3 38 0 15	2 29	0 0 0
Port Hastings	45 39 61 22	43	30 06 30 51 29 81 0 67	41 9	— 2 0 0	21	21 0	28 17 5	0 2 0	3 0	14 0	12 0	31	1 20	3 38 0 15	2 29	0 0 0
Parishore	45 23 64 19	40	30 06 30 51 29 81 0 67	41 9	— 2 0 0	21	21 0	28 17 5	0 2 0	3 0	14 0	12 0	31	1 20	3 38 0 15	2 29	0 0 0
Sydney	46 10 60 10	35	30 05 30 50 29 23 1 27	45 5	— 2 0 58 70 0	23	26 1	18 16 9	2 4 3	3 1	16 10	17 6	62	2 24	2 71 0 91	8 23	0 0 0
Sable Island, E. Point	43 58 59 46	25	30 05 30 50 29 23 1 27	44 9	— 1 37 72 0	23	16 2	29 24 2	2 6 3	7 6	23 4	11 10	72	0 72	3 86 0 25	6 25	0 0 4
Truro	45 22 63 18	77	30 05 30 50 29 23 1 27	45 7	— 1 37 72 0	23	16 2	29 24 2	2 6 3	7 6	23 4	11 10	72	0 72	3 86 0 25	6 25	0 0 4
Windsor	44 59 64 6	90	30 05 30 50 29 23 1 27	47 6	— 1 8 28 61 0	24	35 0	29 17 9	1 3 14	4 9	23 12	24 0	93	1 34	1 52 1 35	1 27	0 0 5
Whitehead	45 15 61 8	20	30 01 30 45 29 37 1 08	46 0	— 1 7 11 73 2	23	26 5	18 19 4	3 5 4	6 3	5 11	11 11	62	0 27	3 71 0 11	6 25	1 0 1
Wolfville	45 7 64 20	65	30 10 30 55 29 55 1 00	47 9	— 0 4 31 61 3	16	28 3	8 11 2	10 7 11	5 3	7 8	4 62	1 62	1 62	3 65 0 73	9 22	0 0 2
Yarmouth	43 50 66 2	65	30 10 30 55 29 55 1 00	47 9	— 0 4 31 61 3	16	28 3	8 11 2	10 7 11	5 3	7 8	4 62	1 62	1 62	3 65 0 73	9 22	0 0 2

## P. E. ISLAND—

Charlottetown	46 14 63 10	38	30 05 30 49 29 38 1 11	45 0	— 2 1 36 65 0	23	28 0	31 13 8	2 6 0	9 6	17 5	14 3	62	1 03	3 61 0 20	8 23	0 0 1
Charlottetown (2)	46 14 63 7	75	30 05 30 49 29 38 1 11	44 5	— 2 61 0	23	27 0	29 13 2	1 0 0	0 0	3 15	10 2	31	1 38	0 31	9 22	0 0 0
Hamilton	46 25 63 48	75	30 05 30 49 29 38 1 11	45 7	— 1 3 14 64 0	21	32 0	13 14 7	1 0 0	0 0	3 15	10 2	31	0 41	3 13 0 28	2 29	0 0 0

## NEWFOUNDLAND—

Amour Point	51 28 56 51	27	30 01 30 45 28 93 1 52	42 7	— 3 58 0	6 11	26 0	3 18 6	0 6 3	1 4	13 16	15 4	62	5 87	— 1 52	12 19	0 0 2
Burns	47 0 55 10	30	29 40 30 39 58 82 1 37	41 8	— 2 58 0	41	28 0	31 9 5	6 4 4	1 5	9 16	12 21	62	3 21	— 1 06	13 16	0 0 0
Cape Norman	49 43 51 17	30	29 40 30 39 58 82 1 37	40 5	— 27 52 0	23	30 0	28 0 0	4 16 4	0 5	3 38	23 0	93	3 46	0 15 1 42	9 22	0 0 3
Fogo	50 42 57 25	35	29 38 30 45 29 12 1 33	40 5	— 3 55 0	46	28 5	31 10 8	3 8 8	2 4	7 13	15 21	62	2 54	0 69	13 16	0 0 3
Point Rich	47 35 59 10	27	29 38 30 45 29 12 1 33	43 7	— 1 7 38 65 0	23	25 0	18 15 6	8 5 5	4 16	13 15	3 1	62	7 31	+ 1 10 1 78	13 18	0 0 0
Port aux Basques	47 35 59 10	27	29 38 30 45 29 12 1 33	43 7	— 1 7 38 65 0	23	25 0	18 15 6	8 5 5	4 16	13 15	3 1	62	7 31	+ 1 10 1 78	13 18	0 0 0
St. John's	47 34 52 42	125	29 40 30 39 25 8 1 39	43 7	— 1 7 38 65 0	23	25 0	18 15 6	8 5 5	4 16	13 15	3 1	62	7 31	+ 1 10 1 78	13 18	0 0 0

## BERMUDA—

Prospect	42 17 64 46	151	30 07 30 25 29 73 0 52	73 7	+ 0 3 21 81 6	20	63 8	19 10 7	8 19 13	4 9	5 1	3 0	62	1 10	6 51 0 78	9 22	0 2 0
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## PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &amp;c., DURING OCTOBER, 1911.

STATIONS	RAINFALL.				SNOWFALL.				REMARKS
	Amount in inches	No. of Days "or over	No. of Heavy Falls in Month	Date	Amount in inches	No. of Heavy Falls in Month	Date		
<b>BRITISH COLUMBIA</b>									
Akai Lake	0.60	3	28	0.40	4				
Alou	0.31	2	29	0.17	14				
Beaver Lake	0.77	3	28	0.42	13				
Comblat	1.88	8	23	0.40	9				
Denman Island	3.44	7	24	1.06	6				
Letouan	0.62	2	24	0.32	13				
Ladder Creek Lake	1.43	10	24	0.39	14				
Hydroton	0.60	1	27	0.30	14				
Island Island	2.80	8	23	0.30	6				
Jordan River	1.86	10	24	0.26	14				
Jordan River (Bent Creek)	3.62	7	24	1.06	13				
Little Qualicum (French Creek, V.I.)	3.62	5	26	1.20	9				
Monte Creek	0.03	1	30	0.03	3				
Nass Harbour									
Skidegate									
Shawigan Lake	1.51	11	20	0.75	14				
<b>ALBERTA</b>									
Bardo	0.53	1	29	0.53	3	1	0.5	18	
Bismark	0.62	2	28	0.44	2	1	0.5	31	
Bruderheim	0.65	3	28	0.55	2				
Bittern Lake	0.31	3	28	0.28	2				
Brooks	0.47	5	25	0.13	2 11	0.5	1	0.5	24
Conjuring Creek									
Coults									
Campsie	0.35	3	28	0.18	2				
Caldwell	0.51	3	25	0.41	2	5.3	3	4.5	24
Dorender	0.10	2	29	0.30	3				
Dunstable	0.32	1	26	0.25	2	0.1	1	0.1	31
Grassy Lake	0.10	1	29	0.10	22	1.0	1	1.0	23
Jumping Pound									
Lacombe									
Loch Sloy	0.31	1	27	0.31	2	2.8	3	2.0	24
Lyon	0.26	1	27	0.26	2	3.5	3	2.0	23
Lyncham									
Macleod	0.21	1	28	0.21	2	3.5	2	3.0	23
Minda (Many Berries R.)									
Mayeroff	0.15	2	28	0.14	2	3.0	1	3.0	24
Okotoks	1	1	24	R	18	1.0	1	1.0	23
Peki-ko	0.60	1	27	0.60	2	3.8	3	3.0	23
Ponoka	0.11	1	30	0.11	3				
Priddis									
Playlet Creek	0.24	5	26	0.13	2				
Sion	0.30	1	29	0.30	18	2.0	1	2.0	22
Seven Persons									
Tilley									
<b>SASKATCHEWAN</b>									
Carmichael									
Couley									
Ebu How									
Forks Swift Current (Gull Lake)	0.87	9	26	0.51	2				
Gull Lake	1.15	1	27	0.65	1				
Gravelbourg	1.29	1	30	1.29	3				
Hanley									
Kindersley									
East Mountain	0.71	1	29	0.71	2		1		31
Maple Creek	0.72	6	25	0.41	3				
Meadow Lake	1.50	4	27	0.58	11	1.0	1	1.0	24
Willow Creek	0.38	1	29	0.38	3				
<b>MANITOBA</b>									
Cartwright	2.06	9	26	1.58	3				
Deloraine	2.61	5	25	1.92	2	0.2	1	0.2	23
Fortna									
Norquay	2.21	6	24	1.11	3		1		20
Rapid City	3.06	3	27	3.00	3	0.1	1	0.1	19
Rosbank									
<b>ONTARIO</b>									
Deer Park	2.90	7	23	1.37	18	1.5	1	1.5	31
Dutton	3.90	9	22	1.00	3				23-26
Emisdale	5.37	13	16	1.27	18				27-30
Georgetown	1.43	10	20	1.17	11	1.1	1	1.1	27
Grandham	3.11	11	20	0.80	18				
Grand Valley	4.17	11	20	1.08	18				
MacCue	2.61	8	23	0.81	1				
Orangeville	5.00	9	22	1.53	7				
Princeton	4.52	6	24	1.33	6	0.5	1	0.5	27
Sydenham	3.87	6	25	1.25	4				
Stratford	3.72	7	23	0.86	6		1		27
Watford	1.11	7	24	1.03	5				
Westport	3.21	5	25	1.12	5	1.5	1	1.5	30
Wooler	4.79	7	24	2.37	18				
Westminster	4.69	6	25	1.43	17				
Wesley	1.27	11	19	0.91	7	1.0	1	1.0	27
<b>QUEBEC</b>									
Kepawa	0.19	2	28	0.12	17	0.1	1	0.1	31
Leerne	0.17	7	22	1.27	17				27-31
Perkins Mills	2.87	7	22	1.27	17				
Quinze Jours	3.38	8	23	1.25	22				
Timiskaming	3.22	10	21	1.11	22				
<b>NEW BRUNSWICK</b>									
Point Escominac	0.90	3	28	0.61	12				
<b>NOVA SCOTIA</b>									
Kentville	0.61	1	26	0.46	27	1.5	1	1.5	28
Kedgemakooze Lake (New Grafton)	0.88	3	28	0.36	23				
Liverpool	1.46	6	25	0.52	31				
Milton (Rapid Fall-Mild)	1.15	3	28	0.55	24				
South Alton	0.58	1	26	0.40	24	2.0	1	2.0	28
White Rock	1.28	6	25	0.47	27				



MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
OCTOBER, 1911.

STATIONS.	HOURS ENDING															
	1 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	
Victoria .....				.02	.12	.31	.43	.51	.56	.55	.50	.46	.53	.56	.01	
Salmon Arm .....				.01	.11	.35	.56	.69	.72	.79	.79	.72	.42	.10		
Nanaimo.....					.01	.12	.29	.43	.42	.45	.46	.43	.39	.14		
Vancouver.....					.09	.35	.51	.59	.55	.52	.53	.51	.52	.33	.02	
Agassiz.....					.02	.39	.48	.58	.66	.71	.65	.59	.52	.11		
Dunvegan.....					.07	.34	.41	.47	.53	.62	.62	.70	.60	.28		
Summerland.....					.03	.61	.76	.78	.78	.79	.77	.76	.63	.65	.21	
Kamloops.....					.28	.70	.71	.78	.87	.88	.85	.79	.62	.16		
Edmonton.....					.01	.24	.41	.55	.57	.61	.57	.58	.60	.60	.40	.01
Lethbridge.....					.02	.47	.64	.66	.72	.70	.67	.59	.58	.54	.40	.05
Lacombe.....					.01	.27	.52	.60	.67	.67	.69	.68	.63	.54	.41	.02
Medicine Hat .....					.12	.52	.67	.78	.72	.66	.66	.63	.54	.29		
Fort Vermilion.....																
Dunvegan.....																
Battleford .....					.06	.27	.40	.48	.55	.58	.62	.65	.62	.57	.15	
Indian Head.....						.13	.48	.48	.50	.56	.57	.52	.51	.46	.13	
Scott.....					.01	.30	.52	.62	.63	.66	.67	.71	.72	.58	.36	
Rosthern.....					.02	.33	.53	.60	.60	.63	.63	.65	.59	.54	.37	
Moosejaw.....					.01	.35	.51	.53	.55	.53	.56	.55	.56	.57	.30	
Brandon .....					.03	.28	.50	.53	.53	.48	.46	.40	.40	.36	.11	
Winnipeg.....					.02	.22	.42	.47	.49	.49	.53	.48	.42	.36	.25	.07
Haileybury.....					.03	.30	.41	.40	.44	.52	.53	.47	.50	.47	.31	.07
Woodstock .....						.11	.49	.58	.60	.62	.61	.58	.53	.48	.30	.02
Lindsay.....						.01	.33	.55	.57	.58	.57	.61	.62	.47	.34	.10
Barrie.....					.02	.33	.43	.52	.52	.53	.49	.48	.46	.45	.21	
Toronto.....						.30	.56	.60	.66	.68	.68	.64	.60	.50	.27	T
Kingston .....						.15	.32	.35	.47	.49	.57	.58	.58	.53	.24	
Ottawa .....					.03	.28	.46	.46	.59	.55	.53	.51	.53	.54	.37	.06
Montreal.....					.06	.32	.46	.51	.51	.50	.51	.50	.50	.51	.33	
Quebec.....					.03	.30	.43	.48	.46	.47	.48	.47	.44	.37	.28	.02
Sherbrooke.....					.06	.38	.48	.47	.50	.50	.51	.49	.42	.34	.22	.02
Cap Rouge.....					.10	.39	.46	.41	.41	.43	.40	.37	.37	.31	.22	.01
Fredericton.....					.02	.37	.54	.55	.67	.69	.67	.70	.63	.59	.41	.19
Charlottetown.....						.20	.44	.44	.49	.56	.61	.58	.59	.46	.31	

	Victoria.	Salmon Arm.	Nanaimo.	Vancouver.	Agassiz.	Dunvegan.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Ft. Vermilion.	Battleford.	Indian Head.	Moosejaw.	Scott.	Rosthern.	Brandon.	Winnipeg.	Haileybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Quebec.	Sherbrooke.	Cap Rouge.	Fredericton.	Charlottetown.	
Registered duration in hours.	137	164	98	140	147	112	213	206	159	187	177	170	141	133	135	156	180	170	126	131	139	153	147	137	170	133	152	145	131	136	121	185	145	
Percentage of possible duration %.....	41	50	29	42	44	44	63	61	48	56	53	51	41	46	40	46	54	51	37	39	41	45	43	40	50	40	45	46	39	40	35	54	43	
Difference from average %.....	+6	..	..	..	+9	..	..	..	..	..	..	..	..	-2	+2	..	..	..	-2	-1	..	+6	+3	+6	+6	+0	+10	+5	..	..	..	+10	..	
Maximum percentage in one day %....	90	89	80	93	86	83	92	84	92	96	88	84	81	90	85	92	95	99	97	96	92	90	85	87	90	83	94	98	90	98	94	96	87	
Date of maximum .....	7	7	16	25	26	16	31	7	10	30	16	15	8	16	27	13	16	26	26	9	10	28	18	7	13	7	13	14	3	10	14	28	25	
No. of days completely clouded.....	4	2	11	6	6	4	2	1	6	3	3	4	2	3	6	5	2	3	3	9	5	6	5	6	6	6	10	6	3	7	5	7	7	4

*Aurora recorded:*

Where the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

2. Fort Vermilion III.
3. Fort Vermilion II.
4. Fort Vermilion II.
5. Sion, Oliver, Fort Vermilion IV.
6. Waitefield II, Oliver, Fort Vermilion III.
7. Pakan III, Waitefield II, Oliver.
8. Sion, Brandon, Aitkensville IV, Schreiber, Winnipeg III, Oliver, Fort Vermilion II.
9. Sion, Renfrew, Esterhazy III, Oliver, Melfort II.
10. Chaplin IV, Luseland, Muenster I (very brilliant), Peace River Crossing II, Sion II, Cartwright III, Emsdale II, Hillsdown III, Halkirk, Pakan IV, Waitefield I, Brandon (brilliant), Hillview I, Treherne, III, Oakbank, Kakabeka Falls III, Halibarton (very bright), Chicoutimi, Fredericton I, St. Stephen, Haileybury I, Winnipeg II, Kingston, III, Stonecliffe I, Aitkensville, IV, Carberry, Aweme I, Beatrice IV, Schreiber, Ronville, North Gower, Matheson III, Montague Madoc, II, Lake Talon, Parry Sound III, Montreal I, Quebec, IV, Grand Manan IV, St. John III, Halifax III, Campsie I, Lunenburg II, Waseca, Glenbryan, Oliver, Estevan III, Fort Vermilion I, Maple Creek, Crescent Lake II.
11. Sion, Loch Sloy, Harmattan II, Schreiber, Chicoutimi, Minnedosa I, Port Arthur I, Ottawa II, Esterhazy IV, Delia.
12. Sion, Esterhazy III.
13. Haileybury IV.
14. Sion, Chicoutimi, Chaplin IV.
15. Sion, Chaplin IV.
16. Sion, Red Deer I, Waitefield II, Birnam III, Fort Vermilion III, Delia.
17. Sion, Red Deer I, Treherne III, Aitkensville II, Kakabeka Falls IV, Esterhazy IV, Estevan IV.
18. Sion, Red Deer, Kakabeka Falls, Haileybury II, Esterhazy IV, Fort Vermilion IV, Crescent Lake.
19. Sion, Waitefield III, Haileybury IV, Fort Vermilion III.
20. Sion, Red Deer I.
21. Sion III, Halkirk, Waitefield III, Schreiber IV, Fort Vermilion II.
22. Waitefield IV, Fort Vermilion III.
23. Crescent Lake III.
24. Sion, Waitefield IV, Aitkensville IV, Haileybury IV, Quebec IV.
25. Sion, Aitkensville IV.
26. Sion, Waitefield III, Waseca, Fort Vermilion III.
27. Sion, Waitefield III.
28. Sion IV, Waitefield IV.
29. Sion IV.
30. Sion IV.
31. Sion, Waitefield III.

*Thunder recorded:*

2. Last Mountain.
3. Emsdale, Dutton, Beatrice, Providence Bay, Paris, Lucknow, Point Clark.
4. Halibarton, Birnam, Fredericton, Southampton, Parry Sound.
13. Golden, Wilmer.
15. Cottam.
16. Cottam.
17. Bruce Mines.
18. Cottam.
21. Point Clark.
22. Lucknow, Southampton, Parry Sound.
23. Clinton, Brome
25. Chicoutimi.

## FORECASTS FOR OCTOBER, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1243. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			Per- centage.
		No. Fully	No. Partly	No. Not	
Alberta.....	79	65	11	3	89.2
Saskatchewan.....	81	63	16	2	87.7
Manitoba.....	81	66	12	3	88.9
Lake Superior.....	115	81	24	10	84.9
Lower Lake Region.....	119	95	18	6	87.4
Georgian Bay.....	118	86	27	5	84.3
Ottawa Valley.....	95	79	14	2	90.5
Upper St. Lawrence.....	95	83	9	3	92.1
Lower St. Lawrence.....	113	91	15	7	87.2
Gulf.....	117	88	23	6	83.0
Maritime Provinces West.....	115	78	20	17	76.5
Maritime Provinces East.....	115	80	22	13	79.1
Total.....	1243	955	211	77	85.3

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto.

November 27, 1911.





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UNIVERSITY OF TORONTO

**DEPARTMENT OF MARINE AND FISHERIES, CANADA.**  
**METEOROLOGICAL SERVICE.**

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# Monthly Weather Review

VOL. XXXV.

NOVEMBER, 1911

No. 11.

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## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm-signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

## TEMPERATURE.

### BRITISH COLUMBIA.

In the far northern districts of the province, the Cariboo region, and along the upper reaches of the Fraser River, temperatures dropped below zero, Fahrenheit, on the 8th, and severely cold weather continued till the 17th, 30° below zero having been registered in the interval. The remainder of the month was, with the exception of the 26th and 27th, much milder. On the North Coast and on Vancouver Island, the second week was cold, minimum temperatures of the month occurring then, and ranging between 7° and 10° above zero. In the northern portion of the Okanagan Valley, portions of the Kootenays, along the Thompson River and the north branch of the Columbia, the second week was marked by temperatures well below zero. At Glacier and Golden, in the last-mentioned locality, 15° and 27° below zero were registered, respectively.

The mean temperature of the month was lower than the normal November temperature over the whole of the province. The difference from normal, while not great on the coast or on Vancouver Island, ranged between 6° and 10° in the interior.

### THE WESTERN PROVINCES.

The mean temperature of November, 1911, was well below the average of the preceding twenty-five years, the differences ranging from 4° to 11°. At Winnipeg, the mean was nearly 7° below the twenty-five year average, but compared with the average temperature of the preceding forty years (including the observations made in the early days of Manitoba at Fort Garry), was only 3° less. In the more northerly portions of Alberta and Saskatchewan, the differences from normal temperature were least. In Manitoba the lowest mean temperatures were, speaking generally, found in the western portion.

The month began with temperatures very close to zero, but the remainder of the first week was mild. A period of severe cold began on the 9th and lasted till the 18th, during which the thermometer registered temperatures lower than 20° below zero in practically all districts, and 30° below in many places lying north of the 52nd parallel. During the remainder of the month the weather was, on the whole, milder, although on the 28th and 29th, the minimum temperatures were again everywhere below zero.

## ONTARIO.

The weather of the Lake Superior districts was very similar to that experienced in eastern Manitoba. In the northern portion of the District of Nipissing the lowest temperatures of the month, from 10° to 15° below zero, were recorded on the 16th and 17th, and again on the 25th, while 5° below was registered on the last two days. In the Lake Temiskaming district the cold was not so severe, the mean temperature at Haileybury exceeding that at Porcupine and at Cochrane by 6°, while the lowest temperature at Haileybury was 2° below zero, registered on the 25th. The mean temperature at Stoneliff, on the upper Ottawa River, was 2° higher than that of Haileybury, while the mercury did not descend below zero during the month, the coldest days having been the 17th and 25th, when 1° above was the minimum reading.

In the peninsula of Ontario mean temperatures ranged from 2° to 4° below the normal and were about 10° higher than the mean temperatures of the Lake Temiskaming region and about 16° higher than those of Northern Nipissing. Except locally in the counties below the Georgian Bay, and in the central counties of South Eastern Ontario, temperatures below zero were not recorded in southern Ontario.

## QUEBEC.

In Western Quebec the coldest days of the month were the 15th, 17th, 18th and 23rd, the minimum temperature generally occurring on the 17th and ranging from 7° to 10° through the district. Along the Middle St. Lawrence the minimum occurred in the last week and varied between 5° and 10°.

In Northern Quebec the cold was more severe, 2° below zero having been registered on the 30th at La Tuque, and 10° below at Lake Edward. On the Saguenay River the coldest weather, 3° above zero, was experienced during the last week. 5° below was recorded on the 16th and 17th at Abitibi, and 15° below on the 22nd, 24th and 25th. In the Gaspé Peninsula the extremes of temperature were 63° and 9°.

The mean temperature of the month was about 2° lower than the normal over the greater part of Quebec, but at Montreal was scarcely 1°, and at Abitibi nearly 5° lower.

## THE MARITIME PROVINCES.

Mean temperatures ranged between 1° and 2° below the normal except in the southwestern portion of Nova Scotia, where the difference was practically nothing. The lowest temperatures of the month were, in nearly all instances, about 15°.

*The highest and lowest temperatures recorded in each Province during the month of November, 1911, were:*

British Columbia, . . . . . 68	at Ruskin on the 1st,	—31	at Chilcotin on the 10th.
Alberta, . . . . . 62	at Alix, on the 25th,	—37	at Banff on the 11th.
Saskatchewan, . . . . . 56	at Indian Head on the 4th,	—35	at Regina on the 11th.
Manitoba, . . . . . 51	at Aweme on the 4th,	—28	at Brandon on the 15th.
Ontario, . . . . . 70	at Southampton on the 12th,	—22	at White River, 16th and 21st.
Quebec, . . . . . 67	at Brome on the 12th,	—15	at Abitibi on the 22nd.
New Brunswick, . . . . . 65	at Chatham on the 13th,	6	at St. Stephen on the 26th.
Nova Scotia, . . . . . 63	at Wolfville on the 13th,	11	at Truro on the 4th.
P. E. Island . . . . . 59	at Charlottetown on the 13th,	13	at Charlottetown on the 13th.

## PRECIPITATION.

## BRITISH COLUMBIA.

In the interior of the Province, except in the southeast Kootenay, the precipitation was in excess of average. On the lower Fraser and the coast, as well as locally in the Cariboo region, there was a deficiency. On Vancouver Island, however, the excess was from one-third to one-quarter of the average. In the lower interior the precipitation consisted of rain during the first and third weeks, and of snow during the second.



## THE WESTERN PROVINCES.

At Banff precipitation was nearly normal, while at Medicine Hat it was in excess. Elsewhere in Alberta there was a small deficiency.

In Western Saskatchewan there was nearly the normal amount, while eastwards precipitation was in excess by more than one hundred per cent. of the normal.

In Manitoba the distribution was very irregular, some places showing a small deficiency and others a moderate excess.

Rain occurred at many places throughout the West on the 3rd and 4th, and at a few on the 5th, but during the remainder of the month precipitation consisted wholly of snow.

## ONTARIO.

Precipitation was nearly everywhere in the province very heavy, and much in excess of average. Thunder and lightning accompanied rain on the 11th in the northern districts. In northwestern Ontario and the Georgian Bay district snow fell every day from the 13th to the 20th, and again on the 22nd, 23rd, 25th, 27th, 28th. In the southern counties the precipitation was more often in the form of rain.

## QUEBEC.

At Montreal, in the "Eastern Townships," and at Father Pt. the precipitation was a little less than normal, but at Quebec City the average was well exceeded, while at Cape Chatte and Cape Magdalen the precipitation was very heavy. At Abitibi there was an excess of about 80 per cent.

## THE MARITIME PROVINCES.

While there were some local exceptions, for the most part in Southern New Brunswick, the precipitation in the Maritime Provinces was in the main above average, and in some parts of Nova Scotia heavily so. In northern New Brunswick rain and snow fell on an equal number of days, but elsewhere rain on a large majority of days.

## DEPTH OF SNOW ON THE GROUND.

On the last day of the month the ground was snow-covered from Saskatchewan to the Maritime Provinces with the exception of a large part of Southern Ontario where the ground was bare. In northern districts the depth exceeded 12 inches, elsewhere it was from 2 to 8 inches.

## THICKNESS OF ICE.

Thickness of ice was reported as follows:—

WESTERN PROVINCES.—Battleford, 6 inches; Swift Current, 26; Minnedosa, 14.

ONTARIO.—Cochrane, 4 inches; Port Arthur, 4; Ottawa, 5.5.

MARITIME PROVINCES.—Fredericton, 4 inches.

## ATMOSPHERIC PRESSURE.

The mean value of the atmospheric pressure for November was in excess of the average in Alberta and British Columbia, and in defect elsewhere in Canada. Positive differences were about 0.05 of an inch in British Columbia and about 0.02 of an inch in Alberta, while the amount of the defect increased eastwards from Saskatchewan to about 0.12 of an inch over the Gulf of St. Lawrence and the eastern part of the Maritime Provinces. The extremes of departure from average were +0.065 of an inch at Victoria, B.C., and -0.136 of an inch at Father Point, Que.

## HIGH AREAS.

Sixteen areas of high pressure were charted; four first appeared in the Yukon Territory and three on the Pacific Coast of the United States. The general track of the areas was south of the Great Lakes to the Middle Atlantic coast, thence either directly out to sea or over the Maritime Provinces and Newfoundland. The areas were for the most part very pronounced and attended by much cold weather. The system which on the 21st passed into the North Pacific States from the ocean, afterwards proved to be of remarkable energy and persistence. It covered the Pacific States, its centre shifting northwards and southwards until the close of the month and the early days of December—a branch, however, meanwhile detached itself from the main area and passed between the 28th and 30th to the Gulf of Mexico.

## LOW AREAS.

Sixteen areas of low pressure were charted. Eleven first appeared in the northwestern portion of the continent, one in the North Pacific States, one in the Western States, one in the Southwest States and two in the Gulf of Mexico. The general track of the areas was over the Great Lakes and down the St. Lawrence Valley; the two systems which appeared in the Gulf of Mexico proving the exception to the rule and passing up the United States Atlantic Coast. The areas were in many instances of much energy and quite often of unusual intensity and gales were of frequent occurrence. The total wind mileage for the month from British Columbia to our Atlantic Coast was very considerable and much in excess of the large amount which is as a rule recorded in November.

## WINDS, NOVEMBER, 1911

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of days of Gales.	Number of days of Strong Winds.	Number of days of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Victoria .....	6840	534	37	4	10	3	S.W.
Point Garry .....	7125	603	35	7	8	6	E.
ALBERTA.							
Edmonton .....	4371	345	23		1	2	
Calgary .....	3963	249	21		1	5	W & N.W.
SASKATCHEWAN.							
Swift Current .....	6632	330	20		3	12	SW.
Qu'Appelle .....	8257	432	24		9	11	SW. & W.
Prince Albert .....	3495	227	15			2	W.
MANITOBA.							
Winnipeg .....	8202	470	30	1	10	9	SW.
ONTARIO.							
Port Arthur .....	9168	695	42	7	11	4	NW.
Parry Sound .....	8436	576	32	2	6	14	SE. & SW.
Southampton .....	10666	738	34	5	16	5	S. & S.W.
Pelee Island .....	12592	813	58	12	13	4	
Woodstock .....	8911	635	31	5	9	7	SW.
Toronto .....	11991	902	42	6	16	5	SW & W.
QUEBEC.							
Quebec .....	10422	639	44	6	13	8	SW.
MARITIME PROVINCES.							
Fredericton .....	7108	592					NW.
St. John .....	12467	858	44	14	8	2	NW.
Halifax .....	10452	593	44	9	11	4	NW.
Point Lepreau .....	16009	1038	54	19	4	2	W.
Flat Point .....	15576	1188	56	21	6	2	W.
Charlottetown .....	7497	567	30	1	8	9	NW.







PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, NOVEMBER, 1911

• Stations not furnished with Register, "Thermometers"

[illegible]

MAYNORTH—



Cypress River.	49	33	99	3	1232	14	5	—	5	49	0	4	—	11	0	15	17	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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## PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &amp;c., DURING NOVEMBER, 1911.

STATIONS	RAINFALL					SNOWFALL			
	Amount in inches	No. of Days of or over	No. of Fair Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days	Heaviest Fall in Month	Date
BRITISH COLUMBIA—									
Aberdeen Lake	0.71	4	19	0.48	24	7.5	7	2.5	6
Amos	3.18	12	10	0.88	7	24.0	8	8.8	14
Better Lake	4.58	14	14	1.00	11-11	11.4	2	14.0	11
Coquitlam	12.01	15	14	1.16	17	3.3	1	3.3	8
Dominion Island	3.00	12	16	0.50	20	20.0	2	20.0	13
Ferguson	0.10	1	16	0.10	18	89.0	13	15.0	14
Goldstream Lake	11.24	20	6	2.23	12	11.5	4	4.0	8
Hydroun	0.48	1	19	0.38	4	31.3	10	8.5	5
Hornby Island	4.01	9	20	1.25	2	24.0	1	24.0	12
Jordan River	18.01	20	8	4.92	18	8.5	2	5.5	8
Jordan River (Bear Creek)	19.50	18	6	3.88	17	16.9	6	5.4	12
Little (Quebecan) French Creek A.I.	4.58	9	19	1.56	19	21.0	2	20.0	12
Monte Creek	0.44	3	23	0.40	6	15.0	4	9.0	13
Nova Harbour									
Skidegate									
Stawogee Lake	4.76	17	9	1.34	13	33.0	4	19.0	12
ALBERTA—									
Barolo						4.0	3	2.0	8
Bismark	0.24	1	26	0.24	3	4.6	3	1.0	8
Bruderheim	0.08	1	24	0.08	4	5.0	5	1.0	6-16
Butter Lake	0.09	1	24	0.09	4	3.5	5	0.8	7
Brooks	0.12	1	23	0.12	4	11.5	6	4.0	7
Canine Creek									
Chutts									
Chippew	0.11	1	24	0.11	4	3.9	5	1.0	21
Codywell						29.3	6	14.0	8
Dorville	0.30	1	27	0.30	1	1.5	2	4.0	10
Dundale	0.07	1	18	0.07	3	5.1	11	1.2	6
Grassy Lake	0.55	2	21	0.30	7	5.0	1	2.0	12
Jumping Pound									
Lacombe									
Loch Ness	0.02	1	25	0.03	5	6.5	4	3.5	8
London	0.56	1	27	0.56	4	5	2	6.3	10
Ludham						2	1	1.2	7
Marble						11.3	8	4.0	26
Mind (Many Berries Ranch)									
Milverton	0.02	1	21	0.02	18	19.0	5	12.5	8
Nahchy						0.3	4	0.2	9
Okavos	0.75	1	28	0.75	4	3.0	1	3.0	7
Pekisko						13.3	8	4.3	8
Panoka	0.12	1	26	0.12	6	5.0	3	4.0	7
Pauline									
Payle Creek						11.0	3	6.0	8
Seven Persons	0.15	2	21	0.08	3	11.5	7	5.0	6
Tilley						12.5	3	12.5	7-9
SASKATCHEWAN—									
Carmichael									
Coule									
Jim How									
Lakes Swift Current Gull Lake						19.0	4	8.0	3
Gull Lake									
Gravelbourg									
Hanley									
Kindersley									
Last Mountain									
Maple Creek	0.01	1	22	0.01	5	10.2	7	4.0	8
Meadow Lake						6.8	2	4.5	5
Willow Creek	0.03	1	27	0.03	3	6.0	2	3.5	14
MANITOBA—									
Cartwright						10.0	5	3.5	10
Deloraine						10.3	6	3.3	19
Gretna									
Norquay (Swan Lake)						8.0	1	4.0	11
Rapid City						8.9	5	5.1	9
Rose Bank									
ONTARIO—									
Deer Park	3.23	6	20	0.97	7	1.0	4	1.5	15
Dutton	2.09	4	24	1.25	6	15.0	2	0.0	1
Ennisdale	3.20	8	13	1.50	7	15.8	9	4.0	26
Georgetown	3.00	8	15	0.97	6	8.0	7	4.0	17
Grantham	1.74	8	18	0.59	18	4.6	4	2.5	21
Grand Valley	2.63	17	17	1.09	7	0.0	6	3.0	19
MacCoe	1.70	7	20	0.52	6	7.0	3	3.0	14
Orangeville	3.29	6	16	0.72	7	12.4	8	4.8	17
Princeton									
Sydenham	4.05	6	20	1.70	17	10.0	4	4.0	14
Strathroy	3.88	7	14	1.08	6	18.0	9	5.5	2
Watford	4.13	6	24	1.22	6				
Westport	1.88	6	19	0.82	6	8.6	5	2.5	14
Westminster	3.42	4	22	1.46	7	17.0	4	6.0	15
Wooler	2.75	7	21	0.88	6	4.0	2	2.0	3-14
Wesley	3.37	6	15	1.07	7	23.5	9	7.0	19
QUEBEC—									
Kopawa									
Lucerne									
Perkins Mills	2.56	6	21	1.35	6	1.3	3	0.7	14
Quincy Dam	2.75	3	18	1.60	12	21.5	9	8.0	18
Timiskaming	2.24	4	20	1.09	11	16.5	6	4.0	17
NEW BRUNSWICK—									
Point Escomine	1.28	5	21	0.47	7	8.3	4	3.1	25
NOVA SCOTIA—									
Big Mushamush Lake (Ma honey)	6.12	3	26	3.50	15	5.0	1	5.0	30
Kentville	4.10	8	17	0.86	19	5.8	5	3.5	22
Kedgwick Lake (New Grafton)	4.18	7	20	1.55	25	6.0	3	2.5	3
Liverpool Indian Gardens									
Milton	6.31	9	21	2.18	7				
Mushamush River (Mahone)	6.25	3	26	3.45	15	4.0	1	4.0	30
South Alton	8.45	9	21	2.00	18				
White Rock	4.95	7	23	1.03	18				

MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
NOVEMBER, 1911.

STATION.	HOURS ENDING															
	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.		
Victoria.....			.13	.19	.27	.27	.29	.31	.26	.18	.02					
Salmon Arm.....		.01	.08	.21	.27	.39	.40	.31	.23	.15						
Nanaimo.....				.04	.15	.14	.18	.13	.12	.08	T					
Vancouver.....		.01	.11	.17	.17	.17	.20	.23	.19	.12	.02					
Agassiz.....			.05	.18	.31	.26	.17	.10	.11	.09						
Tranquille.....		.08	.23	.32	.38	.49	.48	.41	.16	.05						
Summerland.....		.07	.17	.24	.35	.42	.39	.36	.30	.09						
Kamloops.....			.07	.28	.47	.45	.40	.39	.36	.06						
Edmonton.....		.02	.30	.56	.61	.59	.58	.52	.40	.19	.01					
Lethbridge.....		.11	.40	.48	.46	.40	.35	.33	.33	.28	.05					
Lacombe.....		.02	.13	.23	.30	.35	.41	.35	.34	.28	.11					
Medicine Hat.....			.17	.37	.51	.53	.51	.17	.40	.17						
Fort Dunvegan.....			.03	.17	.28	.42	.47	.49	.41	.09						
Fort Vermilion.....			.08	.36	.49	.59	.56	.30	.04							
Battleford.....		.10	.38	.59	.63	.61	.56	.44	.32	.22	.02					
Indian Head.....		.01	.15	.32	.46	.51	.57	.57	.54	.24	.02	.01				
Moosejaw.....	.03	.37	.53	.57	.56	.57	.54	.54	.40	.07						
Scott.....		.09	.37	.42	.47	.46	.47	.48	.32							
Rosthern.....		.19	.42	.56	.56	.60	.56	.55	.51	.36	.05					
Brandon.....	T	.23	.58	.56	.61	.66	.62	.50	.43	.21	.02					
Winnipeg.....		.04	.29	.40	.47	.56	.54	.47	.43	.41	.17					
Halleybury.....		.05	.13	.13	.18	.16	.19	.25	.15	.12	.06					
Woodstock.....		.02	.08	.22	.27	.38	.35	.33	.30	.20	.05					
Lindsay.....			.10	.27	.30	.31	.32	.32	.35	.29	.13	.02				
Barrie.....		.06	.24	.26	.30	.28	.28	.27	.25	.14						
Toronto.....		.03	.18	.25	.31	.43	.48	.41	.31	.26	.05					
Kingston.....		.02	.11	.22	.26	.33	.33	.33	.28	.30	.17	.01				
Ottawa.....		.05	.25	.34	.33	.41	.36	.38	.30	.24	.05					
Montreal.....		.01	.16	.31	.34	.33	.37	.37	.30	.24	.03					
Cap Rouge.....		.06	.23	.24	.22	.22	.29	.25	.21	.13	.03					
Quebec.....		.02	.23	.26	.26	.28	.36	.34	.30	.20	.07					
Sherbrooke.....		.04	.23	.24	.25	.25	.26	.25	.24	.13	T					
Fredericton.....		.08	.26	.45	.45	.52	.47	.49	.37	.22	.11					
Charlottetown.....		.08	.23	.27	.22	.25	.26	.27	.27	.23	.13					

	Victoria.	Salmon Arm.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Lacombe.	Medicine Hat.	Fort Dunvegan.	Fort Vermilion.	Battleford.	Indian Head.	Moose Jaw.	Scott.	Rosthern.	Brandon.	Winnipeg.	Halleybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Cap Rouge.	Quebec.	Sherbrooke.	Fredericton.
Registered duration in hours .....	59	62	26	42	38	78	72	74	113	96	75	94	71	89	116	104	125	106	131	133	113	43	66	73	63	82	71	81	73	57	70	57	102
Percentage of possible duration ....	21	23	9	15	14	29	27	28	44	35	29	35	29	38	45	39	46	41	50	49	42	15	23	25	22	28	25	29	28	20	24	20	36
Difference from average %.....	+0				-5										+11	+15			+17	+7		-3	-0	+2	-1	-2	+1	-2				+4	
Maximum percentage in one day ....	85	73	62	89	57	80	93	72	96	96	97	82	81	89	95	87	92	98	98	89	96	97	91	77	68	84	80	96	89	79	80	77	88
Date of maximum .....	21	27	4	21	1	20	1	20	17	11	1	22	1	29	1	1	11	19	2	2	17	3	3	1	3	16	22	3	3	17	13	5	20
Number of days completely clouded.....	13	14	22	15	18	11	9	9	5	5	8	6	11		6	7	5	9	5	3	10	15	15	13	11	7	13	9	10	11	12	15	10

*Thunder, continued.*

When the class of aurora is noted by the observer, it is given, (I), being the brightest, (IV) the feeblest in brilliancy.

1. Treherne III, Fort Qu'Appelle IV.
2. Aweme III, Aitkensville III, Muenster I.
3. Aitkensville III, Quebec IV, Fort Vermilion III, Fort Qu'Appelle IV.
4. Chicoutimi, Aitkensville III.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
11. Sion, Fort Qu'Appelle IV.
12. Schreiber IV, Hillyview I, Aweme II, Treherne III, Aitkensville III, Fort Vermilion I.
13. Kakabeka Falls IV, Schreiber III, Waitefield IV, Carcross (Brilliant), Aitkensville IV, Minnedosa II, Muenster III, Fort Qu'Appelle IV.
14. Schreiber IV, Hillyview I, Treherne IV, Sion IV, Aitkensville IV, Waseca, Prince IV, Muenster IV, Melfort IV, Fort Vermilion.
15. Sion IV, Aitkensville IV, Minnedosa III, Yellow Grass, Fort Qu'Appelle IV.
16. Sion IV, Waseca, Oliver.
17. Sion IV.
18. Sion, Prince II, Gatesgarth III.
19. Waitefield IV, Oliver.
- 20.
21. Sion, Prince IV.
22. Prince IV.
23. Sion.
24. Waitefield IV, Sion, Fort Vermilion III.
25. Hillsdown IV, Waitefield IV, Sion, Aitkensville IV, Waseca.
26. Waitefield IV, Aweme IV, Sion, Campsie IV.
27. Sion, Gravenhurst I, Aitkensville IV, Cape Magdalen.
28. Sion.
29. Sion.
30. Sion, Aitkensville IV.

*Thunder recorded:—*

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
8. Fredericton.
- 9.
10. Quinze Dam.
11. Porcupine, North Bruce, Copper Cliff, Paris, Montreal River, Elora, Bruce Mines, Westport, Uplands.
12. Montreal River, Brome, D'Israeli, Montreal, Parry Sound.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.
- 21.
- 22.
- 23.
- 24.
- 25.
- 26.
- 27.
- 28.
- 29.
- 30.



## FORECASTS FOR NOVEMBER, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1333. These were divided as follows:—

District.	No. Issued.	VERIFIED.			
		No. Fully.	No. Partly.	No. Not.	Per- centage.
Alberta .....	79	61	12	3	88.6
Saskatchewan.....	81	63	15	3	87.0
Manitoba.....	87	71	11	5	87.9
Lake Superior .....	119	94	22	3	88.2
Georgian Bay.....	130	108	17	5	89.6
Ottawa Valley .....	108	81	19	8	83.8
Upper St. Lawrence .....	108	86	17	5	87.5
Lower Lake Region .....	131	105	22	4	88.5
Lower St. Lawrence.....	123	93	27	3	86.5
Gulf.....	120	91	27	2	87.1
Maritime Provinces West .....	123	81	37	5	80.9
Maritime Provinces East .....	124	92	26	6	84.7
Total .....	1333	1029	252	52	86.6

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto,  
December 21, 1911.

11/11/11

DEPARTMENT OF MARINE AND FISHERIES, CANADA.  
METEOROLOGICAL SERVICE.

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# Monthly Weather Review

VOL. XXXV.

DECEMBER, 1911

No. 12.

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## INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraphic reports of observations received at this office for the purpose of weather forecasting and reports by mail from voluntary observers and storm signal agents. For the data used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D. C.

## TEMPERATURE.

### BRITISH COLUMBIA.

On the Upper Fraser and in the Cariboo region of British Columbia temperatures below zero were recorded on the 17th, 23rd, 28th, 29th, 30th and 31st; 19° below, 20° below and 30° below were the lowest temperatures registered respectively at Chilcotin, Barkerville and Quesnelle. In the Okanagan Valley the last three days were very cold, but temperatures below zero were recorded on the 31st only. In the Kootenays, however, and on the north branch of the Columbia, on the majority of the days of the last week minimum readings were below zero at many stations. Along the Lower Fraser minima ranged from 10° to 20°.

The mean temperatures were lower than the average except over a small part of Vancouver Island and a portion of the coast of the mainland. In the extreme southwest the difference from average amounted to more than 5°, and in the Cariboo region to more than 3°.

### THE WESTERN PROVINCES.

In Alberta mean temperatures in the mountains were about 6° below average, and in the north-western portion of the province about 3°. At Medicine Hat and Calgary temperature conditions were normal, while in the eastern portion there was an excess over average of about 1°.

In Central and Southeastern Saskatchewan the mean temperatures were from 2° to 4° above average, while at Prince Albert and Battleford and the regions north of those towns they ranged from 1° above to 1° or more below normal.

In Northwestern Manitoba the excess over average temperature was barely 1°, but this increased to 5° in the eastern districts.



The final part of the month was very mild throughout the Western Provinces, but a severe cold wave, which was first felt in Alberta and Saskatchewan about the 21st and in Manitoba about the 20th, kept the temperatures below zero till after the close of the month. At several places the highest temperatures recorded on the 28th were 30° below zero, and temperatures as low as 50° below zero recorded in the northern localities.

## ONTARIO

Throughout the Province of Ontario mean temperatures were very high, exceeding the normal average by from 5° to 11°, the greatest differences from average occurring in the Lake Teniskaming district. On the 3rd and 4th temperatures from 5° to 10° below zero were recorded in the Georgian Bay counties and in northeastern Ontario. In the Lake Superior districts weather of similar severity to that experienced in Manitoba during the last week of the month obtained at the same time. From the 9th to the 12th the weather in the southern counties was exceptionally mild, maxima ranging from 55° to 58°.

## QUEBEC

In the Abitibi region, and at Montreal, and in the "Eastern Townships" the differences from normal temperature were very large. There was an excess over average throughout the Province of Quebec ranging from 10° at Montreal and Brome to 5° in the Gulf of St. Lawrence. In this province, also, the temperatures were exceptionally high from the 9th to the 12th, maxima ranging from 55° to 58° in the western counties. On the 4th and 5th, the 20th and 30th and 31st, temperatures were considerably below zero in many districts. At Lake Edward the lowest recorded was 22° below and at Quebec City 8° below.

## THE MARITIME PROVINCES.

Mean temperatures exceeded the average by from 4° to 8° in New Brunswick and by 4° in Prince Edward Island. In Nova Scotia, however, the range of difference from normal was from 0.5° to 3°. Minima of zero or slightly below were recorded at some places in New Brunswick on the 21st and 31st, but in Nova Scotia and Prince Edward Island no severe cold was experienced.

*The highest and lowest temperatures recorded in each Province during the month of December, 1911, were:*

	HIGHEST.		LOWEST.
British Columbia . . . . .	59 at Kamloops on the 7th.	10	at Fort St. James on the 29th.
Alberta . . . . .	65 at Alix on the 3rd.	— 59	at Fort Vermilion on the 28th.
Saskatchewan . . . . .	47.4 at Maple Creek on the 5th.	— 51	at The Pas on the 29th.
Manitoba . . . . .	45 at Ninette on the 9th.	— 50	at Swan River on the 29th.
Ontario . . . . .	63 at Stoney Creek on the 8th.	— 30	at Kenora and White River on the 29th.
Quebec . . . . .	57.5 at Ste. Anne de Bellevue on the 11th.	— 23	at Abitibi on the 30th.
New Brunswick . . . . .	59 at St. Stephen on the 12th.	— 7.5	at Chatham on the 31st.
Nova Scotia . . . . .	62.5 at Wolfville on the 13th.	3	at Pt. Hastings on the 29th.
P. E. Island . . . . .	53 at Charlottetown on the 12th.	7	at Charlottetown on the 29th.

## ATMOSPHERIC PRESSURE.

The mean value of the atmospheric pressure for December exceeded the normal throughout Canada, except in Central and Northern British Columbia, and over the greater part of Alberta, where the average was not reached. Positive departures from average were nearly 0.10 of an inch in the Maritime Provinces, and somewhat less elsewhere. Negative differences in British Columbia and Alberta were from 0.03 to 0.07 of an inch. Extremes of differences from normal at the telegraph stations were  $-0.07$  of an inch at Kamloops, B.C., and  $+0.10$  of an inch at Yarmouth, N.S.

## LOW AREAS.

Fourteen areas of low pressure were charted, six first appeared on the far northern British Columbia coasts and Alaska, one on the north Pacific United States coast, four in the vicinity of the west coast of the Gulf of Mexico, one in Southern Saskatchewan, one over Lake Superior, and one in Northern Maine. Five areas passed north of the Great Lakes, four over them and two to the southward. Some few of the systems were very energetic, chiefly during the latter half of the month, but as a whole they were not important, and strong winds and gales were not as prevalent as in the preceding month of November.

## HIGH AREAS.

Six areas of high pressure were charted. One appeared in the Yukon Territory, one to the northward of Manitoba, and four on the United States Pacific Coast. One area passed north of the Great Lakes, two over and three south of the Great Lakes. The areas from the Pacific were remarkable for the persistency with which they hovered over the Pacific States, while the area which appeared in the Yukon Territory on the 25th, and subsequently spread over the larger portion of the continent, caused winter weather to set in generally over the Dominion after a long period of unusually mild conditions.

## PRECIPITATION.

On Vancouver Island there was a marked deficiency of rainfall, amounting to more than half of the normal amount. Over the mainland of British Columbia, however, there was, generally, no lack. In Central Saskatchewan, Alberta and Manitoba less than the normal amount was recorded. In the Georgian Bay counties of Ontario, and also in some eastern districts, the deficiency was considerable, while in other parts of the same province there was a small excess. Along the River St. Lawrence there was a small excess, but elsewhere in Quebec less than average precipitation occurred. In the Maritime Provinces there was a general and pronounced deficiency.

## DEPTH OF SNOW ON THE GROUND.

At the close of the month the ground was snow-covered from Alberta to Northern New Brunswick, with the exception of a few scattered localities, principally in the extreme southwest counties of Ontario. The depth on the ground was generally from 2 to 4 inches, but in the Gaspé Peninsula, the western part of Algoma, and in Keewatin over 20 inches were reported.

## THICKNESS OF ICE.

Thickness of ice was reported as follows:

WESTERN PROVINCES.—Battleford, 20 inches; Swift Current, 20; Moose Jaw, 23; Qu'Appelle, 16; Minnedosa, 18; The Pas, 14.

ONTARIO.—Port Arthur, 4.5 inches; Cochrane, 7; Southampton, 2; Port Stanley, 2; Ottawa, 5; Georgetown, 3; Clinton, 2½.

MARITIME PROVINCES.—Chatham, 6 inches; Fredericton, 9; Sydney, 5; Charlottetown, 3; St. Stephen, 9; Sussex, 6; Point Le Preaux, 3.



## WINDS, DECEMBER, 1911

PROVINCES AND STATIONS.	Total Mileage.	Greatest Mileage in 24 hours.	Greatest Mileage in one hour.	Number of days of Gales.	Number of days of Strong Winds.	Number of days of Fresh Winds.	GENERAL DIRECTION.
BRITISH COLUMBIA.							
Victoria .....	6310	404	34	3	7	12	E.
Point Garry .....	6571	506	38	5	5	9	E.
ALBERTA.							
Edmonton .....	3714	341	18	.....	2	3	SW. & NW.
Calgary .....	3661	343	23	.....	2	4	W. & NW.
SASKATCHEWAN.							
Battleford .....	4835	491	26	.....	4	7	SE.
Prince Albert .....	1948	116	8	.....	.....	.....	SE.
Qu'Appelle .....	6782	441	25	.....	8	6	SE. & SW.
MANITOBA.							
Winnipeg .....	6814	402	32	1	6	11	SW. & W.
ONTARIO.							
Port Arthur .....	6758	423	30	1	8	7	NW.
Parry Sound .....	6506	458	33	1	5	5	SW.
Southampton .....	10154	678	43	3	11	7	S.
Woodstock .....	7749	610	34	2	7	5	SW.
Toronto .....	11247	896	47	6	14	5	SW. & W.
QUEBEC.							
Quebec .....	11631	725	43	11	8	5	NE. & SW.
Father Point .....	12597	866	50	13	9	5	W.
MARITIME PROVINCES.							
Fredericton .....	6854	775	41	4	4	4	NW.
St. John .....	10516	1071	55	6	1	6	NW.
Point Lepreau .....	14628	1190	56	14	10	5	N.
Halifax .....	9374	780	41	5	11	4	N. & NW.
Flat Point .....	15116	1092	57	19	11	2	N. & NW.
Charlottetown .....	5855	480	25	.....	6	8	NW.

referred to as "thermometers" and "thermometers" in the paper.





## DEPARTMENT OF MARINE AND FISHERIES, CANADA: METEOROLOGICAL SERVICE.

## PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, DECEMBER, 1911

\* Stations not furnished with Recording Thermometers

STATION	Pressure			Temperature			Mean temperature of day	Mean relative humidity	Mean amount of cloud	Direction of Wind from						Velocity of Wind			Precipitation																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Latitude N	Longitude W	Elevation above sea level in feet	Mean reduced.	Highest.	Lowest.				Date.	Date.	Date.	Date.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	C.	Total number of observations.	Mean to 24 hr.	Highest.	Velocity.	Direction of rain.	Amount.	Difference from previous day.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

MANITOBA—



\* Stations not furnished with Registering Thermometers  
a Barometer not reduced to Sea Level



## NEW BRUNSWICK—

47	3 65 29	21	30 01 30 54 28 98 1 56	24 8 +	6 3 36 52 5	12	- 7 5	31 14 1	7	10	3	6	10	2	0	10	22	7	3	62	3 33 +0.15 1 44	12 19	0 0 0
48	4 66 26	39	30 01 30 54 28 98 1 56	23 2 +	8 6 36 47 0	12	- 2 0	2 11 5	7	7	0	0	4	1	0	6	17	0	3	31	2 60 -0.15 1 20	5 24	0 0 0
45	57 06 36	104	30 08 30 45 29 17 1 28	21 2 +	5 2 39 56 0	12	- 2 0	31 14 6	7	7	1	12	8	6	1	9	17	37	2	93	2 03 -1 48 0 70	7 24	0 0 3
44	47 06 46	49	30 08 30 56 29 20 1 36	33 1 +	3 6 27 56 0 11-12	9 0	0 0	29 12 1	6	5	6	8	7	1	1	9	3	24	3	62	2 42 -0 07 1 75	7 21	0 0 0
46	9 64 45	50	...	26 1 +	6 5 14 56 0 11-12	9 0	0 0	30 15 7	...	...	1	2	7	1	1	0	2	16	0	31	1 40 -0 81 1 00	6 26	0 0 1
45	4 36 28	30	...	30 9 +	5 1 33 48 0 11-13	10 0	0 0	30	5	9	15	10	5	2	4	10	7	25	0	78	3 17 -0 23 2 42	5 24	0 0 2
45	1 36 4	70	30 06 10 44 29 22 1 22	29 2 +	5 0 39 52 0	11	3 0	31 11 5	6	7	9	11	3	3	6	3	3	19	5	62	2 95 -1 08 1 86	10 21	0 0 3
45	11 17 16	35	...	27 3 +	5 0 14 59 0	12	- 1 0	21 15 2	...	...	0	2	0	1	0	3	2	3	19	31	3 53 +0 14 1 93	7 24	0 0 2
45	38 35 38	69	...	26 7 +	7 8 14 55 0	12	0 0	6 14 7	...	...	0	2	0	1	0	3	2	3	19	31	2 74 -1 12 1 85	4 27	0 0 0

## NOVA SCOTIA—

45	38 61 59	50	...	31 0 +	1 7 37 56 6	12	11 2	20 11 6	...	...	12	9	5	2	1	9	11	15	4	62	3 40 -2 29 1 58	11 21	0 0 1
44	39 63 36	88	30 03 30 47 29 20 1 27	28 4 +	0 7 19 48 0	3 13	3 0	29 11 7	...	...	0	2	0	1	0	9	0	16	0	31	1 05 -2 55 0 95	2 26	0 0 0
45	39 61 22	45	...	25 6 +	0 4 15 48 0	12	7 0	30 12 8	...	...	0	2	0	1	0	9	0	16	0	31	...	...	0 0 0
45	23 64 19	40	...	31 3 +	2 1 38 50 0	12	12 5	29 10 2	9	24	3	5	3	1	2	7	16	23	2	62	2 40 -3 29 1 22	6 25	0 0 1
46	10 09 10	35	29 37 30 54 28 93 1 61	31 7 +	1 37 47 0	13	22 0	29	...	...	10	9	5	6	11	15	13	8	6	93	4 60 -	1 10	5 26 0 0 2
43	58 50 46	25	...	30 7 +	4 1 37 55 0	13	4 5	31 12 5	...	...	10	9	5	6	11	15	13	8	6	93	2 17 -	1 06	8 25 0 0 5
45	22 03 18	77	...	30 7 +	0 61 5	14	9 0	29 11 8	...	...	5	3	4	5	2	14	26	30	0	93	1 43 -	0 50	6 25 0 0 0
44	59 64 0	90	...	31 5 +	0 7 28 46 0	13	15 0	29	...	...	4	5	4	3	4	10	12	15	5	62	2 00 -1 81 0 75	4 27	0 0 4
45	15 61 8	20	29 93 30 45 29 00 1 36	30 5 +	5 2 11 62 5	12	9 5	29 12 9	...	...	4	5	4	3	4	10	12	15	5	62	1 10 -2 87 1 04	6 25	0 0 0
45	7 64 29	65	30 08 30 46 29 25 1 21	33 8 +	2 0 31 53 2	12	16 3	20 10 0	...	...	16	4	15	3	2	5	3	9	1	62	2 18 -2 57 1 31	9 22	0 0 3
43	50 66 2	65	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

## P. E. ISLAND—

46	14 63 10	38	30 01 30 48 29 01 1 47	28 9 +	3 8 36 51 0	12	7 5	29 9 6	...	...	2	9	0	3	5	8	7	23	5	62	1 75 -2 00 0 85	6 25	0 0 0
46	14 63 7	75	...	28 7	2 53 0	12	7 0	29 10 6	...	...	...	...	...	...	...	...	...	...	...	...	1 84 -	0 33	13 18 0 0 0
46	25 63 48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

## NEWFOUNDLAND—

51	28 56 51	27	29 38 30 58 28 93 1 65	26 6	3 46 0 12 13	5 0	6 19 3	7	4	0	4	2	8	10	25	2	62	3 01	—	0 70	15 16	0 0 0				
47	0 55 10	...	...	15 7	27 33 0 12 27	— 2 0	31	...	...	...	49	10	3	1	1	3	10	16	0	93	1 98	—	0 50	8 23	0 0 0	
51	38 55 52	...	...	23 0	2 40 0 12	8 0	22 23 8 2	...	...	...	17	7	0	1	3	2	12	16	0	58	5 06	—	0 80	18 13	0 0 1	
49	43 54 17	30	29 82 30 46 28 77 1 69	39 1	27 36 0 12 26	— 7 0	31	...	...	...	33	14	0	5	7	11	16	0	93	2 65	—	0 51	1 20	5 26	0 0 0	
50	42 57 25	35	...	26 2	3 43 5	12	10 5	6 10 0	...	...	9	8	5	1	0	5	9	25	0	62	3 37	—	0 50	18 13	0 0 0	
47	35 50 10	27	29 80 30 53 28 92 1 61	26 2	3 43 5	12	10 5	6 10 0	...	...	9	8	5	1	0	5	9	25	0	62	3 37	—	0 50	18 13	0 0 0	
47	34 32 42	125	29 76 30 58 28 79 1 79	25 7	3 2 38 45 0	12	7 0	23 12 2	7	6	4	6	0	2	1	13	8	28	0	62	4 61	—	0 83	1 20	14 17	0 0 1

## BERMUDA—

32	17 64 46	151	30 19 30 37 29 92 0 45	65 6 +	0 8 20 73 6	28	55 0	21 8 2	...	...	5	18	2	1	2	14	2	9	3	62	3 28 -1 70 1 24	17 14	0 0 1
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## PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &amp;c., DURING DECEMBER, 1911.

STATIONS	RAINFALL					SNOWFALL				REMARKS.
	Amount in inches	No. of Days of or over	No. of Fur Days	Heaviest Fall in Month	Date	Amount in inches	No. of Days	Heaviest Fall in Month	Date	
<b>BRITISH COLUMBIA—</b>										
Alou Lake	0.42	3	23	0.29	8	3.8	5	1.0	26	
Amos	1.40	9	11	0.40	7	21.1	11	4.3	15	
Beaver Lake	1.19	17	14	0.65	22					
Cosquiam	8.55	17	15	2.15	21	11.5	3	1.8	28	
Dominion Island	4.77	14	15	0.72	28	2.0	2	1.5	29	
Ferguson						45.5	11	10.0	7	
Goldstream Lake	6.02	23	5	1.86	22	3.8	3	2.5	29	
Hydraulic										
Hornby Island	4.80	8	23	1.15	18					
Jordan River	8.81	22	9	0.99	22					
Jordan River (Bent Creek)	12.59	16	4	3.12	22	18.1	11	4.5	29	
Little Qualicum Fretch Creek, V.I.	2.80	8	23	0.50	7					
Minto Creek	0.01	1	24	0.09	8	17.5	6	5.0	15-30	
Nass Harbour	7.81	13	16	1.08	22	6.0	2	4.0	21	
Skidegate										
Sawangan Lake	1.13	22	6	0.95	23	7.0	3	3.0	30-31	
<b>ALBERTA—</b>										
Barolo						1.5	1	1.5	9	
Benmark							1		24	
Brieslerheim										
Bittern Lake						3.3	4	2.3	9	
Brooks	0.08	1	29	0.08	9	1.8	1	1.0	23	
Conjuring Creek										
Coutts										
Cumpriss						1.8	4	1.3	20	
Caldwell						8.8	5	5.3	23	
Dorcaslee	0.20	1	27	0.02	2	3.5	3	2.0	31	
Dunstable						2.0	7	0.6	20	
Grassy Lake						5.0	2	4.0	28	
Jumping Pound										
Lambie										
Loch Sney						5.0	4	2.5	24	
Lundin						5.6	2	4.1	23	
Lynchburg						0.5	1	0.5	25	
Maclachlan						10.5	5	5.0	23	
Manda Many Berries Ranch										
Mayeroff						7.2	2	4.8	24	
Nateby										
Oskots						2.5	1	2.5	24	
Pekisko						5.5	3	4.8	23	
Ponoka						5.5	4	2.5	26	
Priddis										
Soon						3.8	4	1.0	25	
Seven Persons						1.5	1	1.5	23	
Telley										
<b>SKETCHED BY—</b>										
Carmichael										
Coulee										
Tim How										
Fork Swift Current Gull Lake										
Gull Lake						27.0	4	9.5	16	
Gravelbourg										
Hanley										
Kinderley										
East Mountain						3.6	7	2.0	9	
Maple Creek						4.8	8	1.0	17-24-25	
Meadow Lake										
Willow Creek						2.0	1	2.0	29	
<b>MONTANA—</b>										
Gartwright						3.3	4	1.0	13-24	
Belomine										
Grota										
Norquay (Swan Lake)						3.5	8	1.0	14-22	
Rapid City						2.6	1	1.6	24	
Rose Bank										
<b>NEBRASKA—</b>										
Deer Park	2.48	10	18	0.44	12	6.0	3	4.1	30	
Dutton	0.95	2	28	0.50	27	1.0	1	1.0	20	
Emdale	0.96	5	20	0.28	27	8.5	6	2.5	17	
Georgetown	1.39	11	12	0.38	11	10.4	8	4.0	27	
Grantham	1.82	9	19	0.55	13	2.8	3	2.0	31	
Grand Valley	1.04	5	20	0.41	12	12.5	6	4.0	29	
MacCoy	1.23	5	24	0.30	15	4.0	2	3.0	16	
Orangeville	1.09	3	17	0.75	12	15.6	11	4.2	28	
Princeton										
Sedalia	2.35	4	25	1.09	11	3.0	2	2.0	17	
Stathroy	1.12	5	21	0.65	11	19.5	5	6.0	30	
Watford	2.18	4	27	0.78	26					
Westport	1.86	4	22	0.58	16	5.3	5	3.0	13	
Westminster	3.83	5	24	2.06	12	5.0	2	3.0	30	
Wesley	3.56	7	21	0.84	11		3		1-14-28	
Wesley	1.33	7	17	0.38	9	23.0	7	10.0	28	
<b>ONTARIO—</b>										
Kepawa										
Lacorne	0.16	2	26	0.13	10	9.5	3	5.0	14	
Perkins Mills	1.71	4	21	0.66	12	15.5	6	6.0	15	
Quince Dam	1.03	1	25	1.00	10	21.5	5	8.5	27	
Timiskaming	0.21	1	24	0.21	19	21.0	6	5.3	31	
<b>NEW BRUNSWICK—</b>										
Point Escomine	0.77	3	24	0.42	23	7.9	4	4.2	23	
<b>NOVA SCOTIA—</b>										
Big Mushamush Lake (Ma- hona)										
Kentville	1.15	2	25	1.08	23	9.0	4	5.5	3	
Kedgemakooze Lake (New Grafton)										
Liverpool (Indian Gardens)										
Milton										
Mushamush River (Mahone)										
South Alton	2.25	2	25	1.75	23	13.0	4	5.0	2	
White Rock	1.53	4	27	1.12	23					

MEAN PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY IN THE MONTH OF  
DECEMBER, 1911.

STATION.	HOURS ENDING															
			7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Salmon Arm.....						.08	.19	.23	.22	.14	.09	.02				
Victoria.....					.02	.14	.17	.19	.28	.31	.25	.09				
Nanaimo.....						.01	.14	.16	.12	.02	.03	.01				
Vancouver.....					.05	.15	.23	.26	.28	.27	.24	.07				
Agassiz.....						.14	.35	.28	.24	.18	.16	.03				
Tranquille.....				.03	.14	.17	.27	.34	.31	.22	.03					
Summerland.....					.07	.20	.23	.32	.27	.20	.10					
Kamloops.....					.06	.23	.32	.32	.33	.34	.13					
Edmonton.....					.07	.37	.32	.47	.46	.46	.50	.13				
Lethbridge.....				T	.20	.28	.35	.39	.35	.39	.34	.26				
Laconbe.....					.08	.29	.33	.42	.48	.48	.42	.26	.01			
Medicine Hat.....					.07	.26	.34	.39	.38	.30	.22	.05				
Fort Dunvegan.....								.12	.30	.34	.14					
Fort Vermilion.....					.01	.09	.31	.41	.43	.36	.13					
Battleford.....					.12	.40	.54	.52	.45	.32	.16					
Indian Head.....						.11	.21	.40	.41	.40	.16					
Moosejaw.....					.19	.40	.50	.49	.39	.36	.26	.08				
Scott.....					.12	.19	.25	.24	.26	.32	.31	.14				
Rosthern.....				T	.14	.23	.27	.35	.32	.31	.28	.05				
Brandon.....				.01	.18	.22	.25	.27	.34	.33	.11					
Winnipeg.....					.02	.09	.21	.33	.40	.33	.27	.14				
Haileybury.....				T	.12	.20	.23	.25	.26	.22	.22	.14	T			
Woodstock.....					.09	.21	.19	.23	.22	.22	.22	.17	.01			
Lindsay.....					.03	.19	.31	.25	.26	.27	.28	.18	.03			
Barrie.....																
Toronto.....					.10	.22	.22	.27	.30	.33	.21	.12	.01			
Kingston.....				.01	.22	.38	.38	.38	.45	.48	.44	.28	.06			
Ottawa.....					.12	.27	.32	.38	.43	.39	.30	.13				
Montreal.....					.10	.28	.31	.35	.34	.32	.30	.16				
Cap Rouge.....					.08	.19	.17	.20	.22	.21	.21	.13	.01			
Quebec.....					.10	.18	.23	.24	.27	.26	.23	.17	.01			
Sherbrooke.....				T	.07	.13	.20	.18	.19	.18	.13	.06				
Fredericton.....				.01	.23	.31	.38	.42	.43	.40	.43	.35	.01			
Charlottetown.....					.25	.24	.19	.21	.26	.32	.30	.17	.01			

	Salmon Arm.	Victoria.	Nanaimo.	Vancouver.	Agassiz.	Tranquille.	Summerland.	Kamloops.	Edmonton.	Lethbridge.	Laconbe.	Medicine Hat.	Fort Dunvegan.	Fort Vermilion.	Battleford.	Indian Head.	Moose Jaw.	Scott.	Rosthern.	Brandon.	Winnipeg.	Haileybury.	Woodstock.	Lindsay.	Barrie.	Toronto.	Kingston.	Ottawa.	Montreal.	Cap Rouge.	Quebec.	Sherbrooke.
Registered duration in hours.....	30	45	15	48	43	47	46	53	85	80	85	62	28	53	78	53	82	56	60	50	55	50	48	55	35	55	95	72	66	44	53	35
Percentage of possible duration ...	12	17	5	19	17	19	18	21	37	32	36	25	11	20	33	21	33	23	26	20	22	19	17	20	13	20	34	27	26	17	20	13
Difference from average %.....	—	+2			+2	—	—	—							+2	—2				—14	—13	—	—3	0	—3	—4	+9	+8	0		—7	
Maximum percentage in one day ...	78	74	58	83	68	75	74	64	92	95	95	81	45	73	69	66	91	95	96	83	72	93	91	81	80	80	93	87	94	89	92	78
Date of maximum.....	31	24	8	31	28	31	24	10	2	2	1	2	30	30	26	6	3	11	26	6	31	29	7	7	6	29	19	4	19	4	4	14
Number of days completely clouded.....	21	12	26	16	15	14	15	10	7	7	7	6	14	15	4	11	12	14	14	15	18	13	17	14	15	12	8	14	15	19	18	23



*Auroras recorded:—*

When the class of aurora is noted by the observer, it is given, I being the brightest, (IV) the feeblest in brilliancy.

1. Sion.
2. Sion.
3. Sion.
4. Sion.
5. Sion.
6. Sion.
- 7.
- 8.
9. Sion.
10. Halkirk, Hillview I, Sion IV, Waitefield II, Hillsdown III, Campsie III, Prince I, Peace River Crossing III, Fort Vermilion I.
11. Waitefield I, Minnedosa I, Campsie IV, Muenster IV, Glenbryan II, Divide IV, Crescent Lake III.
12. Sion IV, Waitefield IV, Campsie II, Divide IV, Grenfell, Fort Vermilion I.
13. Sion III, Fort Vermilion III.
- 14.
- 15.
16. Sion.
17. Sion IV.
18. Sion.
19. Kingston I.
20. Sion.
- 21.
22. Sion.
- 23.
24. Sion.
25. Halkirk, Aitkensville IV, Sion, Prince II, Muenster II, Crescent Lake III, Fort Vermilion I, Fort Qu'Appelle II.
26. Chagoness III, Fort Vermilion II, Fairview, Fort Qu'Appelle IV.
27. Chagoness IV, Aitkensville IV, Fort Vermilion II, Fort Qu'Appelle IV.
28. Sion.
29. Sion.
30. Chagoness IV, Sion.
- 31.

*A thunder storm recorded at Southampton on 27th.*

## FORECASTS FOR DECEMBER, 1911.

The forecasts issued by this office at 11 p.m. each night are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of these predictions issued during the month was 1222. These were divided as follows:—

DISTRICT	No. Issued.	VERIFIED			
		No. Fully.	No. Partly	No. Not	Per- centage.
Alberta . . . . .	79	67	10	2	91.1
Saskatchewan . . . . .	78	57	17	4	84.0
Manitoba . . . . .	79	54	19	6	80.4
Lake Superior . . . . .	102	63	27	12	75.0
Lower Lake Region . . . . .	111	79	24	8	82.0
Georgian Bay . . . . .	111	83	21	7	84.2
Ottawa Valley . . . . .	100	76	12	12	82.0
Upper St. Lawrence . . . . .	101	77	14	10	83.2
Lower St. Lawrence . . . . .	111	82	21	8	83.3
Gulf . . . . .	112	76	27	9	79.9
Maritime Provinces West . . . . .	119	93	22	4	87.4
Maritime Provinces East . . . . .	119	80	31	8	80.2
Total . . . . .	1222	887	245	90	82.6

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

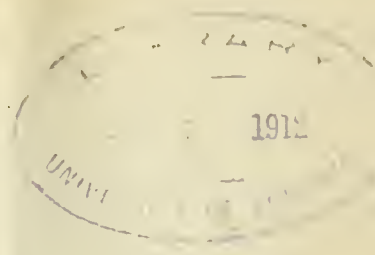
In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART, Director.

Meteorological Office, Toronto,  
January 24, 1912.







DEPARTMENT OF MARINE AND FISHERIES, CANADA.  
METEOROLOGICAL SERVICE.

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SUPPLEMENT TO THE  
**Monthly Weather Review**  
FOR 1911

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FREE AIR CONDITIONS.

The investigation of the free air conditions over Ontario by means of balloons and kites was commenced during the year. In placing the results obtained at the disposal of meteorologists it will suffice for the present to give a brief account of the apparatus and methods employed, reserving the full description and discussion until fairly complete series of observations have been obtained.

BALLOON EQUIPMENT.

Dines' meteorographs were used on all occasions, and all instruments returned have given good results. The greatest difficulty experienced was in producing hydrogen gas in sufficient quantities to fill the balloons. At first the gas was generated from aluminum and caustic soda, but this method required a very great expenditure of time to obtain even sufficient gas for one balloon. This difficulty was finally solved by using calcium hydride and water. The hydride is similar to the carbide, and with a small portable generator it is now a simple matter to fill a balloon in about five minutes, or taking the time of getting the generator, etc., ready for action—twenty minutes at the most. The balloons are made of rubber bursting at about 1.75 or 2 metres diameter.

The ascents were made at first from Toronto, but as only four balloons were returned out of ten despatched, it was deemed advisable to try another locality where the chances of finding them would be better. All the balloons have travelled easterly, and the lake on which Toronto is situated, and the unsettled parts of the country at some distance to the northeast render it extremely probable that the missing balloons fell in the lake or the forest. Woodstock, which is about 80 miles west of Toronto, was next tried; it is much farther from the lake, and within a radius of over 100 miles the country is cultivated. The results from Woodstock have been very satisfactory, and out of twelve ascents, eight balloons have been recovered.

Balloons were sent up on the evening preceding the international days throughout the year at about midnight G.M.T. Generally the ascending and descending temperature pressure curves are different, but of course it is impossible to tell which is ascending and which descending, except that as there is a certain amount of lag, it is most probable that the curve giving the lowest temperature is the descending one. The results are given for each 0.5 km. of height, with intermediate points if there are any inversions or noteworthy features, and the temperatures for the ascent and the descent at each height are given if they are different; if not distinguishable, then only one temperature is given for the height.

## KITE EQUIPMENT.

A kite station has been equipped at Agincourt—latitude  $43^{\circ} 47' N.$ , longitude  $79^{\circ} 16' W.$ , about 14 miles from Toronto. The equipment is similar to that employed by Dines at Pyrton Hill, and the Dines' kites and meteorographs were used during the year. These kites are very easily constructed and the meteorographs are not expensive; for these reasons it was considered advisable to use them at first until the station was in good working order, after which other kinds and types will be tried. Records of pressure, temperature, humidity and wind direction have been obtained. Ascents began on the 28th February, and the highest flight was 7,900 feet above sea-level, obtained on the 28th June.

Toronto—Lat 43° 40', Long. 79° 24'.

**REGISTERING BALLOON—ASCENT AT TORONTO ON 3rd FEB., 1911.**

Instrument—Dines Meteorograph.

Beginning of Ascent—9.40 p.m., G.M.T.

Barometer—750mm.

Temperature =  $-4.2^{\circ}\text{C}$ .

Direction of Flight at Beginning—W., then N., then N.E. at height of 1.1km.

Fell—135km. distant, 25° N. of E.

Maximum Height—11.2km.

Minimum Temperature =  $-68.0^{\circ}\text{C}$ .

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
G.L.	750	-4.2	
.5	716	-6.0	
.8	688	-8.0	
1.0	670	-7.0	-4.0
1.5	629	-5.0	-3.0
2.0	588	-5.0	-4.0
2.5	552	-10.0	-8.0
3.0	518	-13.5	-10.5
3.5	482	-17.0	-15.0
4.0	450	-19.5	-17.5
4.5	421	-23.0	-21.5
5.0	392	-27.5	-25.5
5.5	367	-30.5	-29.0
6.0	341	-35.0	-32.0
6.5	317	-39.0	-36.0
7.0	294	-42.0	-41.0
7.5	273	-47.5	-45.0
8.0	253	-53.0	-51.5
8.5	234	-57.0	-55.0
9.0	216	-61.0	-59.5
9.5	198	-66.0	-64.5
10.0	183	-65.0	-67.0
10.3	174	-68.0	
11.0	156	-64.5	
11.2	152	-63.5	

Feb. 3rd, 1911.

At the time the balloon was let go winds were fresh E. and S.E. all over the Province of Ontario, and continued so for fully 12 hours in advance of a developing trough of low pressure, with two foci, one of which at 8 p.m. was N. of Lake Superior and the other in the Ohio Valley. It is perhaps a remarkable fact that the easterly upper current should have been found at such a low altitude.



Toronto Lat. 43° 40' Long. 79° 24'

## REGISTERING BALLOON—ASCENT AT TORONTO ON 7th JUNE, 1911.

Instrument—Dines Meteorograph.

Beginning of Ascent—9.40 a.m. G.M.T.

Barometer—753mm.

Temperature—12.9 C.

Direction of Flight—Started westward rapidly

Fell—88.5 km. distant. S. 50° E.

Maximum Height—13.9km.

Minimum Temperature—-63.0 C.

Height in km.	Pressure in mm.	Temperature in centigrade degrees	
G.L.	753	12.9	
.5	720	12.0	
1.0	679	11.5	
1.5	640	8.0	
2.0	600	5.0	
2.5	563	1.0	
3.0	529	-1.5	
3.5	498	-3.0	
4.0	467	-5.5	
4.5	438	-7.5	-8.5
5.0	410.5	-9.5	-11.5
5.5	381	-11.0	-14.5
6.0	360	-11.5	-19.5
6.1	354	-11.5	-20.5
6.5	337	-21.5	-23.5
6.7	328	-26.0	-28.0
7.0	314	-27.0	-29.0
7.5	293	-29.5	-31.0
8.0	273	-32.5	-33.5
8.5	254	-35.5	-37.0
9.0	237	-40.0	-41.5
9.5	220	-43.5	-45.5
10.0	203	-47.5	-49.5
11.0	174.5	-54.0	-57.5
12.0	148.5	-59.5	-62.0
13.0	126.0	-62.5	-63.0
13.3	121.0	-63.0	
13.9	109.5	-63.0	

June 6th, 1911.

Gradient for easterly winds—28 miles per hour at 8 p.m. Shallow depression south of the Lakes. During next 12 to 20 hours gradient still easterly, but diminishing.

Toronto—Lat 43° 40', Long. 79° 24'.

# REGISTERING BALLOON—ASCENT AT TORONTO ON 8th JUNE, 1911.

Instrument—Dines Meteorograph.

Fell—66km distant S. 17° E.

Beginning of Ascent—1.25 a.m. G.M.T.

Maximum Height—13.7km.

Barometer—753mm.

Minimum Temperature = -58.0 C.

Temperature = 12.8° C.

Direction of Flight at Beginning—Travelled slowly westward.

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
G.L.	753	12.8	
.26	742	15.0	13.0
.5	721	14.5	12.0
1.0	681	11.8	9.0
1.1	675	10.0	9.0
1.5	643	9.5	7.5
2.0	607	7.0	4.5
2.5	571	5.0	2.5
3.0	537	2.0	-1.0
3.5	503	-1.0	-3.0
4.0	472	-2.5	-4.0
4.5	443	-4.5	-7.0
5.0	415	-8.0	-9.5
5.5	388	-11.0	-13.0
6.0	364	-11.0	-16.5
6.5	340	-17.5	-20.5
7.0	317	-21.0	-24.0
7.5	297	-25.5	-28.0
8.0	277	-30.0	-32.0
8.5	258	-33.0	-36.0
9.0	240	-36.5	-40.0
9.5	223	-40.0	-44.5
10.0	208	-45.5	-48.0
11.0	179	-53.5	-53.5
12.0	154	-56.5	-59.0
13.0	132	-58.0	
13.7	118	-58.0	

June 7th, 1911.

High barometer over Great Lakes and Low over Southern States, with gradient for N.E. winds. Weather mostly cloudy and temperature about normal.

Toronto Lat 43° 40', Long. 79° 24'.

REGISTERING BALLOON—ASCENT AT TORONTO ON 8th JUNE, 1911.

Instrument—Dines Meteorograph.

Fell—80.5km distant, S. 24° E.

Beginning of Ascent—11.40 p.m. G.M.T.

Maximum Height—13.7km.

Barometer—756.2 mm.

Minimum Temperature = -67.0°C.

Temperature = 20.0 °C.

Direction of Flight at Beginning—N.W., then E.S.E.

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
G.L.	756.2	20.0	
.5	720.0	20.0	
.6	712.0	20.0	
1.0	679.5	15.0	
1.5	639.0	11.0	
2.0	601.0	8.5	7.5
2.5	566.0	8.0	4.5
3.0	532	7.0	4.5
3.1	523	7.0	4.5
3.5	500	5.0	3.0
4.0	468	0.0	-1.0
4.5	438	-5.0	-5.5
5.0	410	-8.5	-10.0
5.5	384	-12.5	-15.0
6.0	359	-16.5	-19.0
6.5	340	-19.0	-22.0
7.0	313	-23.5	-27.0
7.5	293	-28.0	-32.0
8.0	272	-32.0	-37.0
8.5	253	-35.5	-41.5
9.0	236	-39.0	-45.5
9.5	219	-43.5	-49.0
10.0	204	-48.5	-53.0
10.5	190.5	-53.0	-57.0
11.0	177	-56.0	-61.0
12.0	151	-62.0	-66.0
13.0	128	-66.5	
13.5	117	-67.0	
13.7	113	-67.0	

June 8th, 1911.

In centre of a high area, with fine, warm weather. On the following day winds were east and southeast in advance of a shallow depression from the westward.



Woodstock--Lat. 43° 8', Long. 80° 47'.

REGISTERING BALLOON--ASCENT AT WOODSTOCK ON 5th JULY, 1911.

Instrument--Dines Meteorograph. Fell--79.8km. distant, N.E.  
 Beginning of Ascent--11 p.m. G.M.T. Maximum Height--17.0km.  
 Barometer--739mm. Minimum Temperature-- $-70^{\circ}\text{C}$ .  
 Temperature-- $27.0^{\circ}\text{C}$ .  
 Direction of Flight at Beginning--S.E., with thunder-  
 storm approaching from N.W.

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
G.L.	739	27.0	
.5	722	27.5	
1.0	681	26.5	24.0
1.5	641.5	22.0	20.0
2.0	605	17.0	
2.5	570	12.5	
3.0	537.5	8.5	
3.5	503	4.5	
4.0	473	1.5	0.0
4.5	444	-1.5	-3.5
5.0	417	-5.0	-7.0
5.5	390	-8.0	-10.0
6.0	364.5	-12.0	-14.0
6.5	341	-16.0	-17.0
7.0	318.5	-20.0	
7.5	298.0	-22.0	-23.0
8.0	278.5	-24.0	-25.5
8.5	260.0	-27.5	-29.0
9.0	242.0	-31.0	-33.0
9.5	225.5	-35.0	-36.0
10.0	209.5	-38.0	-40.0
11.0	180.5	-45.5	-47.5
11.5	167.5	-49.0	-51.0
12.0	155.0	-53.0	-55.0
13.0	133.0	-60.5	-62.0
14.0	112.0	-66.5	-68.0
15.0	94.9	-69.0	-70.0
15.2	91.8	-69.5	-70.0
16.0	80.1	-67.5	
17.0	68.0	-62.5	

July 5th, 1911.

Shallow depression passing north of Great Lakes. Moderate westerly gradient with intense heat for some hours, but next morning gradient for N.W. and N. winds, with approaching high area and change to cooler weather.

Woodstock 43° 4' S. Long. 80° 47'

# REGISTERING BALLOON—ASCENT AT WOODSTOCK ON 2nd AUG., 1911.

Instrument—Dinec Meteorograph.

Beginning of Ascent—11:55 p.m. G.M.T.

Barometer—750mm.

Temperature—24.0

Direction of Wind at Beginning—Slowly eastward.

Fall—93.3km. distant, N.E.

Maximum Height—17.1km.

Minimum Temperature = -66.0

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
0.0	735	21.0	
.5	718	20.5	21.5
1.0	696	16.5	18.0
1.5	687	11.5	15.5
2.0	660	10.5	12.5
2.5	564	7.0	9.5
3.0	529	4.5	6.5
3.5	498	1.5	3.5
4.0	467	-0.5	1.0
4.5	438	-3.0	-2.0
5.0	411	-6.0	-4.5
5.5	384	-9.0	-7.0
6.0	361	-11.0	-9.5
6.5	338	-13.5	-12.0
7.0	317	-16.5	-14.5
7.5	297	-20.0	-17.5
8.0	277	-23.5	-21.0
8.5	258	-27.0	-25.0
9.0	241	-31.0	-29.0
9.5	223	-35.0	-33.5
10.0	208	-38.5	-37.0
11.0	180	-47.5	-45.0
12.0	153.5	-58.5	-56.5
13.0	132.0	-65.5	-64.5
13.6	119.3	-66.0	
14.0	112.0	-66.0	
14.65	100.0	-66.0	
15.0	94.3	-64.0	
16.0	80.0	-62.0	
17.0	67.8	-62.0	
17.18	67.0	-62.0	

## Evening of 2nd August.

Winds were light and variable, but before morning the gradient, although quite slight, was distinctly easterly; temperature a little higher than normal and weather thundery.

Woodstock Lat. 43° 8', Long. 80° 47'.

## REGISTERING BALLOON—ASCENT AT WOODSTOCK ON 7th SEPT., 1911.

Instrument—Dines Meteorograph.

Beginning of Ascent—0.30 a.m. G.M.T.

Barometer—735mm.

Temperature = 15° C.

Direction of Flight at Beginning—Slowly westward.

Fell—116km. distant, S. 80° E.

Maximum Height—10.2km.

Minimum Temperature = - 39.0° C.

Height in km.	Pressure in mm.	Temperature in centigrade degrees	
G.L.	735	15.0	
.5	718	13.0	
1.0	671	11.0	
1.5	635	11.0	12.0
2.0	599	11.0	
2.5	563	10.0	
2.7	551	10.0	
3.0	530	8.0	
3.5	498	4.0	6.0
4.0	468	2.0	4.0
4.5	439	1.0	
5.0	411	2.0	
5.5	387	5.0	
6.0	361	-8.0	
6.5	338	-12.0	
7.0	317	-17.0	
7.5	296	-24.0	
8.0	276	-30.0	
8.5	257	-36.0	
8.8	248	-39.0	
9.0	238	-39.0	
9.5	221	-39.0	
10.2	200		

## Sept. 6th—Evening.

At the time the balloon was let go there was a high pressure area north of Manitoba and the Great Lakes and a shallow depression advancing eastward across the State of Iowa. During the evening and early night, the winds in Southern Ontario were moderate, northeast and east, increasing to fresh in the early morning. The balloon fell 116 km. distant, almost directly opposite to the direction which the surface wind would have carried it.



Woodstock, Lat. 43° 8', Long. 80° 47'

## REGISTERING BALLOON—ASCENT AT WOODSTOCK ON SEPT 9th, 1911.

Instrument—Dines Meteorograph.  
 Beginning of Ascent—2.50 p.m. G.M.T.  
 Barometer—741mm.  
 Temperature—19.4° C.

Fall—18.5km. distant, S. 8° E.  
 Maximum Height—20.2km.  
 Minimum Temperature = -62° C.

7.

Direction of Flight at Beginning—Straight up and then  
 N. E.

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
G.L.	741	19.4	
.5	723	17.5	
1.0	681	14.0	
1.2	663	13.5	
1.5	640	13.0	10.5
2.0	602	10.5	7.5
2.5	566	9.0	6.0
3.0	532	7.0	4.5
3.5	503	4.5	1.5
4.0	474	1.0	-1.5
4.5	449	-1.5	-4.0
5.0	423	-3.0	-5.5
5.5	400	-5.0	-7.5
6.0	375	-7.0	-10.0
6.5	352	-9.0	-13.0
7.0	329	-12.0	-16.0
7.5	308	-15.0	-19.0
8.0	287	-19.0	-22.5
8.5	268	-23.0	-27.0
9.0	251	-26.0	-30.0
9.5	233	-29.5	-34.5
10.0	217	-34.5	-39.0
11.0	188	-42.5	-48.0
12.0	163	-51.0	-55.5
13.0	138	-54.0	-59.0
14.1	117	-57.5	-62.0
15.0	101	-60.0	
16.0	85.6	-58.5	
17.0	72.8	-58.0	
18.0	62.0	-58.0	
19.0	52.8	-58.5	
20.2	43.0	-59.0	

An area of high pressure over the Great Lakes. Winds light and variable. Weather fine. Very feeble depression passed to the northward on the following day.

Woodstock—Lat. 43° S', Long. 80° 47'.

REGISTERING BALLOON—ASCENT AT WOODSTOCK ON NOV. 8th, 1911.

Instrument—Dines Meteorograph.

Beginning of Ascent—11 p.m. G.M.T.

Barometer—736mm.

Temperature = 4.6°C.

Direction of Flight at Beginning—Slow drift to S.S.W.

Fell—204km. distant, E.

Maximum Height—18.5km.

Minimum Temperature = -62°C.

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
G.L.	736	4.0	
.5	713	2.0	
1.0	670	-2.5	
1.48	632	-5.0	
1.51	629	-2.0	-5.0
1.60	621	-2.0	-6.5
1.7	614	-2.0	
2.0	591	-2.5	
2.35	565	-3.0	
2.50	555	-4.5	
3.0	520	-5.5	
3.5	486	-8.5	
4.0	456	-11.5	
4.5	427	-14.0	
5.0	400	-16.5	
5.5	373	-20.5	
6.0	348	-23.5	
6.5	326	-27.5	
7.0	303	-31.0	
7.5	283	-35.0	
8.0	262	-38.0	
8.5	244	-41.0	
9.0	227	-43.5	
9.5	210	-45.5	
10.0	196	-47.5	
11.0	168	-50.5	
12.0	143	-53.0	
13.0	122	-55.0	
14.0	104	-57.0	
15.0	89	-59.0	
16.0	75.7	-61.0	
17.0	64.2	-61.0	
18.0	54.6	-61.5	
18.5	50.0	-62.0	

A ridge of high pressure extended over the whole of Ontario and the Middle Atlantic States, with two foci, one to the north of Lake Huron and the other off the Middle Atlantic Coast; the pressure conditions did not change appreciably during the night.

Registering Balloon—Ascent at Woodstock on Dec 5th, 1911.

# REGISTERING BALLOON—ASCENT AT WOODSTOCK ON DEC 5th, 1911.

Instrument used—Dines anemograph  
 Direction of Ascent—11:45 p.m. G.M.T.  
 Pressure at start—700 mm

Fell—1 km. distant, S. 45° E.  
 Maximum Height—12.4 km.  
 Minimum Temperature—61.5° C.

Temperature—100° C.  
 Direction of Wind at Beginning—E.N.E. in fresh wind

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
		0.0	—1.0
G.L.	716	0.0	—1.0
55	718	2.5	1.5
75	700	4.5	2.5
1.00	679	5.0	3.0
1.20	660	5.0	3.0
1	652	4.0	
1.4	643	4.0	
1.55	642	4.0	2.0
1.80	612	3.5	1.5
2.0	598	1.5	0.0
2.5	560	—0.5	—3.0
3.0	525	—1.0	—3.5
3.5	492	—3.5	—6.0
4.0	461	—7.5	—10.5
4.5	432	—12.0	—15.5
5.0	404	—18.0	—20.0
5.5	378	—22.5	—25.5
6.0	352	—27.5	—30.5
6.5	328	—33.5	—36.0
7.0	304	—39.5	—41.0
7.5	283	—42.5	—44.0
8.0	263	—45.0	—46.5
8.5	243	—47.5	—50.0
9.0	227	—51.0	—53.5
9.5	209	—54.5	—57.0
10.0	192	—58.0	—60.0
10.5	177	—61.0	—62.0
11.0	163		—64.0
11.5	150		—64.5
11.8	143		—64.0
12.0	138		—62.0
12.4	129		

Sent off with a gradient for fresh to strong W.S.W. winds, which continued almost unchanged through night.



Woodstock—Lat. 43° 8', Long. 80° 47'.

## REGISTERING BALLOON—ASCENT AT WOODSTOCK ON 6th DEC., 1911.

Instrument—Dines Meteorograph.

Beginning of Ascent—11.0 p.m. G.M.T.

Barometer—746mm.

Temperature—2.0°C.

Direction of Flight at Beginning—E.N.E. in light wind.

Fell—114km. distant. N. 76° E.

Maximum Height—10.25km.

Minimum Temperature—-57.0°C.

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
G.L.	746	2.0	
.5	721	3.5	
.9	687	6.5	
1.0	678	6.5	
1.1	669	6.5	
1.5	635	4.0	
2.0	597	3.0	1.5
2.1	590	3.0	1.0
2.5	560	-1.0	-2.0
3.0	525	-3.0	-4.5
3.5	491	-5.5	-7.5
4.0	460	-8.0	-10.0
4.5	431	-11.0	-12.5
5.0	403	-14.5	-16.0
5.5	378	-19.5	-20.5
6.0	352	-22.5	-24.5
6.5	328	-24.0	-26.5
7.0	307	-26.5	-27.5
7.5	285	-33.5	-34.0
8.0	265	-38.5	-39.5
8.5	246	-42.0	-43.5
9.0	227	-46.5	-48.0
9.5	211	-50.5	-52.0
10.0	195	-55.0	-55.5
10.25	186	-57.0	

Shallow low over Lake Superior—southwesterly gradient. General direction of flight not over 30° to right of surface current.

Woodstock—Lat. 43° 8', Long. 80° 47'.

REGISTERING BALLOON—ASCENT AT WOODSTOCK ON 7th DEC., 1911.

Instrument—Danes Meteorograph.  
Beginning of Ascent—10 40 p.m. G.M.T.  
Barometer—747 mm.  
Temperature—4.0° C.

Fell—407 km. distant, N. 70° E.  
Maximum Height—12.1 km.  
Minimum Temperature—-57.0° C.

Direction of Flight at Beginning—Straight up and then E.

Height in km.	Pressure in mm.	Temperature in centigrade degrees.	
0.1.	747	4.0	
.5	723	4.0	
.7	707	4.0	
.9	688	6.5	4.0
1.0	679	6.0	4.0
1.5	636	2.0	
2.0	597	0.0	-2.5
2.5	561	-3.0	
2.7	548	-4.0	
2.9	532	-3.5	-5.5
3.0	525	-4.0	-6.5
3.5	492	-9.0	-10.0
3.6	486	-11.0	
3.7	479	-12.0	
4.0	461	-12.0	-14.0
4.5	430	-16.0	-17.5
5.0	401	-19.0	-21.0
5.5	374	-21.0	-24.5
6.0	350	-23.5	-27.0
6.2	340	-25.0	-27.5
6.5	326	-28.5	-30.0
7.0	303	-33.0	-34.5
7.5	282	-37.5	-39.5
8.0	262	-42.5	-44.0
8.5	243	-48.0	-49.5
9.0	224	-52.0	-54.5
9.4	212	-55.0	-57.0
9.5	208	-57.0	
10.0	192	-56.5	
10.5	177	-55.0	
11.0	163	-56.0	
12.0	140	-56.5	
12.1	137	-56.5	

Pressure highest over Middle Atlantic States, diminishing over Upper Lakes; gradient for light but increasing S.W. winds. Direction of flight somewhat, but not greatly, to right of the surface wind direction.

## KITES CARRYING METEOROGRAPHS

RESULTS OF FREE AIR OBSERVATIONS, AGINCOURT, CANADA

DATE	TIME	HEIGHT IN METRES ABOVE S.L.	Pressure in m.m.	TEMP. °C	Relative Humidity	WIND		REMARKS
						Direction	Velocity m.p.s	
1911	h. m.							
February 28th....	1.30	171	754	— 4.4				
	1.50	490	723	—13.3				
	2.10	500	722	—11.4				
March 6th.....	12.15	171	758	— 5.6		N.E.	4.5	
	2.00	350	738	—10.0				
	2.45	300	742	—11.7				
	3.15	320	740	—12.8				
March 19th.....	12.45	171	741	2.2	90	E.	4.0	
	1.15	610	710	— 2.8	91			
	1.45	610	710	— 4.4	94			
	2.05	700	702	— 6.1	100			
	2.30	650	725	— 3.3	100			E. to E S. E.
	2.40	610	710	— 4.4	100			throughout.
	3.00	680	722	— 1.7	100			
	3.15	610	710	— 5.0	100			
March 28th.....	11.45	171	739	— 3.3	75		10.7	
	12.05	430	714	— 8.3	95			
	12.15	680	691	— 8.9	100			N. W.
	12.25	650	695	— 8.9	100			throughout
	12.55	430	714	— 7.2	100			
March 31st.....	11.26	171	737	— 1.7	65		9.4	
	11.40	440	710	—12.2	80			
	11.56	610	695	—15.0	90			N. W.
	12.20	940	666	—15.0	62			throughout
	1.10	1080	652	—15.6	20			
	1.40	410	712	— 2.8	85			



## KITES CARRYING METEOROGRAPHIC

RESULTS OF FREE AIR OBSERVATIONS AGINCOURT, CANADA.

DATE	TIME	HEIGHT	Pressure	TEMP. C	Relative Humidity	WIND		REMARKS
		IN METRES ABOVE S.L.	in m.m.			Direction	Velocity m.p.s.	
1911	h. m.							
April 12th	11 15	171	760	5.6	50	S.E.	6.7	
	11 35	420	736	3.9	33	S.W.	1.5	
	11 50	740	706	0.0	60	S.W.	13.4	
	12 10	950	688	1.7	86	S.W.	17.9	
	12 30	1140	671	— 1.7	100	In cloud		
	1 00	1350	651	— 2.2	100	In cloud		
	1 15	1450	645	— 2.2	100	In cloud		Shower at 1.10
April 19th	12.36	171	742	7.2	88			
	12.46	480	716	5.6	82			
	1 08	610	704	6.1	81			East Wind
	1 40	600	707	6.1	80			
April 22nd.	9.36	171	746	6.9	75			
	10.30	760	695	— 2.5	95			
	10.52	530	714	— 1.9	95			Wind East
	11 00	1110	662	— 4.4	93			throughout flight.
	11 50	1530	627	— 8.1	94			Encountered
	12 14	1620	621	— 8.1	96			cloud at about
	1.06	1650	618	— 9.2	80			1200 m elevation
	1 25	1930	597	— 10.3	95			
	1 46	1330	646	— 8.6	95			
May 2nd .	12 53	171	744	1.1	40		6.7	
	1.37	660	701	— 3.9	55			
	2 05	960	674	— 5.6	60			Wind W.N.W. at
	2 27	620	704	— 5.0	60			surface. Kite in
	2.57	920	679	— 6.1	57			cloud at 750 m.
	3 19	490	717	— 2.8	52			elevation

## KITES CARRYING METEOROGRAPHS

RESULTS OF FREE AIR OBSERVATIONS, AGINCOURT, CANADA.

DATE	TIME	HEIGHT IN METRES ABOVE S.L.	Pressure in m.m.	TEMP. C	Relative Humidity	WIND		REMARKS
						Direction	Velocity m.p.s.	
1911	h. m.							
May 8th.....	10.38	171	749	23.3	75			
	11.10	600	710	21.7	60			
	12.49	490	722	21.1	59			Wind south at
	1.33	950	681	16.7	59			surface and west
	2.02	1160	665	15.0	60			at all elevations
	3.27	1240	657	12.8	65			given here.
	4.19	1540	632	7.8	70			
	4.37	900	687	15.6	69			
May 10th.....	10.07	171	743	14.4	93	E.	8.0	
	11.42	720	694	12.2	85	S.S.E.		
	12.20	370	726	12.2	80	S.E.		
	1.00	870	682	11.7	75	S.		
	1.08	490	716		78			
May 12th.....	10.08	171	745	23.9	72			
	10.48	800	691	23.0	62			
	11.20	1130	667	16.7	68			
	11.30	300	732	21.1	55			West wind
	11.50	870	686	18.3	50			throughout flight.
	12.08	1420	642	11.7	58			Day very clear
	12.24	1510	637	10.0	67			
	12.57	710	699	9.4	52			
	1.15	1350	648	1.7	68			
	1.38	910	680	11.1	70			
May 16th.....	9.50	171	749	15.6	80	E.		
	10.10	290	736	13.3	83	S.E.		Surface wind
	10.18	400	727	12.8	88	"		6.3 metres per
	11.22	520	717	11.7	79	"		sec. at 11 a.m.
	1.40	500	719	12.8	70	"		3.4 at 2 p.m.

DATE	TIME	HEIGHT	Pressure	TEMP. C	Relative Humidity	WIND		REMARKS
		IN METRES ABOVE S. L.	in m.m.			Direction	Velocity m p.s.	
1911	h. m.							
May 24th. ....	10.18	171	747	21.7	55			
	11.00	630	706	13.9	72			
	11.33	880	686	10.0	78			
	11.53	1340	647	6.7	77			
	1.05	1635	623	7.2	95			West wind
	1.52	1460	635	5.6	89			throughout flight.
	2.44	1830	608	4.4	65			and day clear
	3.16	1450	636	6.7	57			
	3.32	1500	633	6.7	60			
	4.47	1260	654	7.8	65			
May 29th. ....	10.35	171	751	18.9	40			Surface wind
	11.35	466	724	16.7	40			north, shifting
	1.10	668	708	18.9	15			towards west as
	2.13	761	697	17.8	8			kite ascended.
June 1st. ....	9.25	171	742	18.9	58			
	9.45	870	680	10.0	84			Clouds at 450
	10.05	650	700	11.1	68			metres elevation.
	10.27	1420	637	11.1	46			Wind N.W. at
								surface, shifting
								to W. at highest
								elevation.
June 1st. ....	12.00	171	742	17.8	80	N.W.	6.3	
	12.25	350	724	9.4	85			
	12.45	550	707	6.7	95			
	1.05	900	678	2.8	100	W.N.W.		
June 14th. ....	12.54	171	738	20.6	51			
	1.03	300	723	17.8	57			Wind north
	1.08	509	706	14.4	61			throughout flight
	1.12	670	693	12.8	68			

Continued



## KITES CARRYING METEOROGRAPHS

## RESULTS OF FREE AIR OBSERVATIONS, AGINCOURT, CANADA

DATE	TIME	HEIGHT	Pressure	TEMP. °C	Relative Humidity	WIND		REMARKS
		IN METRES ABOVE S.L.	in m.m.			Direction	Velocity m.p.s.	
1911	h. m.							
June 14th..... (continued)	1.24	750	685	12.2	71			Wind north throughout flight
	1.30	840	677	10.6	77			
	2.12	1170	653	8.9	79			
	2.28	1408	631	6.1	89			
	2.46	1000	663	8.9	81			
	2.50	800	681	11.7	67			
	2.55	1040	660	9.4	74			
	3.00	870	675	11.1	70			
June 28th.....	10.10	171	745	19.4	60			Cumulous cloud at 1300 metres elevation. Wind S.W. at surface, west above 750 metres.
	11.00	520	712	13.3	80			
	11.53	750	694	12.2	90			
	12.34	920	677	10.6	100			
	12.44	1310	648	7.8	100			
	1.09	1390	642	8.3	90			
	1.19	1920	601	11.1	35			
	1.35	2390	571	11.7	18			
	1.40	2410	569	12.2	17			
	1.52	1910	604	10.0	10			
	2.06	910	680	10.0	100			
	2.18	1310	648	8.9	100			
	2.33	1030	669	12.2	100			
	2.48	850	686	10.6	100			
July 22nd.....	10.55	171	742	22.8	38	N.W.	6.7	
	11.45	680	700	14.4	46	N.W.		
	12.15	890	683	13.9	58	N.W.		
	12.30	980	675	13.3	53	N.W.		
	12.45	830	686	15.0	50	N.W.		
	1.10	1000	673	12.8	53	N.W.		

## KITES CARRYING METEOROGRAPHS

RESULTS OF FREE AIR OBSERVATIONS, AGINCOURT, CANADA

DATE	TIME	HEIGHT IN METRES ABOVE S. L.	Pressure in m.m.	TEMP. C	Relative Humidity %	WIND		REMARKS
						Direction	Velocity m.p.s	
1911	h. m.							
July 25th	9 25	171	741	13.9	75	W.	9.8	
	10 03	710	692	6.7	96	"		
	10 13	710	692	7.8	97	"		
August 18th	2 55	171	747	21.1	75	N. W.	7.1	
	3 05	550	712	13.3	81	N. N. W.		
August 22nd	9 55	171	745	25.0	50	S. W.	Fresh	
	10 15	220	737	27.2	50			
	10 25	460	716	23.9	50			
	10 35	780	692	21.1	50			
	10 40	1000	675	18.9	50			
	10 48	1200	659	16.1	50	W. N. W.		
September 12th	10 45	171	743	15.0	59	N. W.	6.7	
	11 10	540	708	6.1	78			
	11 35	810	686	2.8	84			
	11 55	930	674	1.1	90			
	12 15	650	700	4.4	75			N.W. wind throughout
	12 37	850	682	2.2	86			
	12 52	1090	662	0.6	80			
	1 15	1090	662	0.0	80			
	1 30	1150	657	- 1.1	78			
	1 45	1020	667	0.6	82			

## KITES CARRYING METEOROGRAPHS

RESULTS OF FREE AIR OBSERVATIONS, AGINCOURT, CANADA

DATE	TIME	HEIGHT IN METRES ABOVE S.L.	Pressure in m.m.	TEMP. °C	Relative Humidity	WIND		REMARKS
						Direction	Velocity m.p.s.	
1911	h. m.							
November 14th...	12.05	171	748	0.0	80	S.W.		
	12.20	400	726	— 5.5	90			
	12.35	700	699	—10.0	75	W.S.W.		
	12.55	1010	670	—10.5	60			
	1.15	1310	645	—13.0	60	W.		
	1.25	1550	624	—14.0	90	W.		
	1 50	1530	626	—14.0	100	W.N.W.		
November 15th...	11.05	171	737	0 0	45	W.S.W.	6.3	
	11.15	510	704	— 1.0	50	W.		
	11.25	825	677	— 3.5	55	"		
	11.40	1090	655	— 5.0	58	"		
	11.50	1210	644	— 5.5	57	"		
	12.15	920	669	— 5.0	57	"		
November 30th...	10.36	171	713	— 2.0	63	W	8.5	
	10.40	350	727	— 7.0	63	"		
	10.52	560	707	—11.0	65	"		
	11.11	690	696	—10.5	67	"		
	11.30	600	702	—10.5	78	"		











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